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1984-1985
Economic Handbook of the Machine Tool Industry

Compiled by the Statistical Department

National Machine Tool Builders' Association
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(NMTBA Members $20.00)

FOREWORD

For the U.S. machine tool industry 1983 was a year in which market conditions, both in the U.S. and in major export markets, showed little improvement. In fact, when measured in terms of shipments, 1983 was a disastrous year. Deliveries of new machine tools totaled just $1.8 billion for the year, slightly more than half the level of the previous year and only about one-third the 1981 total. The only consolation for the industry was that order receipts for the year were up. But this was small consolation since the increase was a meager 13% over the extremely low level of 1982. When measured in constant, inflation-adjusted terms, 1983 was the worst order and shipment year experienced by the U.S. machine tool industry since the end of WWII.

Throughout 1983, while the economy as a whole experienced robust growth, the machine tool industry failed to share in the cyclical expansion. However, during the first six months of 1984, the market for machine tools appears to have begun to recover. New orders for the January–June period were 91% ahead of the comparable 1983 total. Shipments, reflecting the slow pace of orders in 1983, are presently only 7% ahead of their 1983 six-month total, but they appear to be gathering momentum. The fact that the industry has turned around is a positive sign, as are recent surveys that indicate that manufacturers plan to boost their capital spending appreciably during the remainder of 1984 and into 1985.

However, while these signs are encouraging, they hardly signal a return to prosperity for the industry. Machine tool builders as a group lost money during 1983 and are presently still in a state of financial crisis due to the modest recovery in shipments. Getting through the current cash-flow crisis is the industry's immediate concern. Though we are headed in the right direction, 1984 is proving to be another very tough year for the machine tool industry.

A factor complicating the prospects for recovery in the domestic machine tool industry is the spectre of further import inroads into the American machine tool market. Imports comprised over 35% of the machine tools installed in the U.S. in 1983 and have shown every sign of maintaining or increasing this market share as the recovery unfolds.

It is because of the threat of import dominance in the machine tool market, the industrial backbone of American manufacturing and America's defense industries, that the NMTBA filed a petition for import relief with the Secretary of Commerce under Section 232 of the Trade Act of 1962, the National Security Clause. While the Association has long been a proponent of free trade and has one of the most active international trade promotion efforts in the trade association field, we cannot stand idly by while key segments of the American machine tool industry are decimated by targeted sales of foreign machine tools. Frequently assisted by subsidies and a variety of preferential programs sponsored by their respective governments, foreign builders have come to dominate certain key sectors of the domestic machine tool market, a fact we find inconsistent with our vital national interests. America is the defender of the industrial West and machine tools are the foundation of our industrial defense preparedness. We cannot allow the nation's defense to be eroded by a loss of our ability too produce, within our boundaries, the machine tools that are needed to maintain our national defense posture, i.e. our ability to produce sophisticated state-of-the-art weapons systems and our ability to deter aggression by our adversaries.

The significance of the threat of machine tool imports goes far beyond the welfare of just the domestic machine tool building industry. If the industry is allowed to be overwhelmed by foreign products, the innovations and new manufacturing process technology that it provides America's manufacturing industries will be lost. Foreign firms will then have the upper hand in the development of new technology and will be the leaders in the drive to more efficient, lower-cost production of manufactured goods. The loss of America's machine tool building capability could well signal the beginning of the decline for all of America's metalworking manufacturing industries.

The Commerce Department fulfilled its statutory obligations by making a recommendation for action on the petition that was submitted to the President in February 1984. The fate of the industry's future then rested squarely in the Oval Office. Despite overwhelming support from Congress for a favorable ruling, the President had not acted by the time of publication of this edition of the Handbook.

As we look beyond our current situation into the next decade and beyond, we feel that the machine tool industry will be called upon to play an even more vital role in America's industrial structure. Since the turn of the century, and especially in the post-World War II era, the United States has undergone a dramatic shift in its economy away from agriculture and manufacturing toward service industries. This has placed a responsibility on each farmer to produce more food to feed our expanding population and has placed an equivalent burden on each industrial employee to produce an ever larger volume of manufactured goods for each member of our society.

Just as mechanization was the answer to the problem of farm productivity, new and better capital equipment is the answer to the problem of industrial productivity. The machine tool industry looks forward to the technological challenge of obtaining more output from each manufacturing worker as it continues to provide its customers the world's most reliable, most productive machine tools.

The 16th edition of the Economic Handbook again offers industry executives, market researchers, legislators, administrators and students an expanded collection of data on the economy and the machine tool industry.

Wide fluctuations in currencies and varied definitions of different time periods account for occasional differences in the data for what appear to be identical subjects in this Handbook. As much as possible, these differences are explained in the chapter introductions, footnotes and the "Explanation of Terms" section at the end of the Handbook. Special explanatory notes for selected data series are also included. The NMTBA Statistical Department is also available to answer any questions concerning this publication. We are constantly trying to improve the value of this book. Your comments and suggestions for future editions are welcome.

James A. Gray
President

August 15, 1984

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TECHNICALLY SPEAKING...

NMTBA offers a series of nine technical publications that contain suggestions, guidelines and information to make your company's operation more efficient and productive.

1 Guidelines for the Measurement of Machine Tool Utilization

This publication suggests a uniform procedure for the measurement and reporting of machine tool utilization. It provides a system to measure the effectiveness of a wide variety of machines and their related resources. It establishes indices of production, availability, utilization and consistent methods for their evaluation.

2 Noise Measurement Techniques

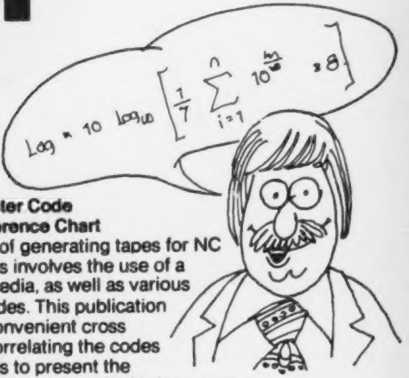
This publication suggests the most recent measuring techniques and procedures for the determination of machine tool sound. A discussion of time-weighted average sound levels is included, as well as a discussion of the disagreement between OSHA and EPA as to the basis for computing noise dosage.

3 Definition and Evaluation of Accuracy and Repeatability of NC Machine Tools

This publication was prepared to help develop a better understanding of the accuracy and repeatability of numerically controlled machine tools. Definitions, methods of computation and testing procedures are thoroughly discussed. This paper is recognized in the COCOM (Coordinating Committee) Regulations which govern the export licensing of NC machine tools.

4 Common Words As They Relate to NC Software

The aim of this publication is to improve communication among those involved with NC computer software. It defines the common terms used throughout the industry including those regarding the preparation and use of computer software for numerically controlled machine tools.


$\text{Log} = 10 \log_{10} \left[\frac{1}{7} \sum_{i=1}^{n} 10 \cdot 8 \right]$

5 NC Character Code Cross Reference Chart

The process of generating tapes for NC machine tools involves the use of a number of media, as well as various character codes. This publication provides a convenient cross reference, correlating the codes and standards to present the needed information in a single document.

6 Standards Index

A bibliography of standards pertinent to the design, manufacture, sale and use of machine tools.

7 Selecting an Appropriate NC Programming Method

Selecting the best NC programming method for a particular set of manufacturing circumstances is an important decision for new and established NC shops alike. The implications of this decision are manifold and an incorrect decision can adversely affect the expected return on high cost capital equipment. This publication explains the elements of manual and computer-aided programming and will help you in selecting the right method for your shop.

8 NC is EZ

This publication is intended as a practical and easy to understand NC primer. It will help prospective first-time NC users plan and execute the installation and start-up of new equipment with a minimum of difficulty.

9 NC Part Programming Profile and Summary Report

This survey and summary report provides data useful to companies to compare their own NC programming efforts with other shops having a similar number of NC machines. It puts in proper perspective the NC programming effort required at shops considering acquisitions – perhaps first-time – of machine tools.

national
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1

NATIONAL ECONOMY AND MACHINE TOOLS

Man is a tool-making animal. Since the beginning of history man has used his tools to make even better tools. The culmination of these efforts are today's modern machine tools. These are the machines that form the basis of much of our modern civilization.

A machine tool is a power-driven machine, not hand held, that is used to cut, form, or shape metal. Few, if any, products and services of an industrialized country would exist were it not for machine tools. There would be no trains, no ships, no planes, no cars. There would be no power plants, no electric lights, no refrigerators, or other electrical appliances. And, without agricultural machines, without modern transportation, and without refrigeration—all dependent on modern machine tools—there would be no way to feed the more than 220 million people in this country.

Yet, such is the efficiency and longevity of the products of the machine tool industry that its present production has always represented only a small part of the nation's total output. The entire U.S. machine tool industry is smaller than many individual corporations. Even the limited data available for the first years of this century show, for instance, that metalcutting machine tools made up only slightly more than 10 cents for every $100 produced in goods and services. In 1983, shipments of complete machine tools made up less than 6 cents of every $100 of Gross National Product.

Comparisons of machine tool consumption with capital expenditures by durable goods manufacturing industries show that machine tools make up a comparatively small but significant part of total expenditures for plant, machinery, and other equipment.

Machine tools are typically installed as capital equipment in metalworking industries. The data on machine tools installed in U.S. plants (see Chapter 9) and data collected by NMTBA indicate that the major users of machine tools are the metalworking industries: fabricated metal products, machinery, and transportation equipment (among the latter, primarily the automobile and aerospace industries). Thus, this chapter focuses on private investment, on expenditures for new plant and equipment, and on the orders and shipments of the metalworking industries. Business activity in these industries is likely to affect their capital expenditures and, in turn, to affect the orders that flow to the machine tool industry. However, many other factors also seem to affect the ordering of new machine tools.

The machine tool industry is highly sensitive to the treatment of corporate capital consumption allowances such as investment tax credits and depreciation. Changes in these affect the willingness and ability of the industry's customers to make machine tool purchases. The work of many students of the machine tool industry has indicated that corporate profitability, financial conditions, and the general level of business confidence are also important determinants of machine tool order activity.

Capacity utilization is recognized as another significant determinant of future business investment in plant equipment and thus in machine tools. While attempts to measure the utilization in a broad spectrum of industries are fairly recent, there are several existing series on capacity utilization in manufacturing. In this issue, three of the available measures are presented. Also included are capacity utilization series for selected machine tool consuming industries as published by the Bureau of Economic Analysis and the McGraw-Hill Publications Company.

Currently, there is much concern in the United States about the erosion of our capital stock. For instance, studies have shown that the average age of the machine tool population in this country has gone up significantly in recent years. Investment apparently has not kept up with the need to replace aging capital assets in U.S. metalworking industries. Several tables showing the stock of capital assets in various machine tool consuming industries are in this chapter. Of particular interest are the tables relating purchases and depreciation of capital goods in manufacturing industries, and the tables of business capital appropriations in current and constant dollars.

Many figures shown in this chapter are in current dollars . . . dollars not adjusted for changes in purchasing power. Overall changes in the purchasing power of the dollar, as measured by producer or consumer prices indexes, provide a measure of the erosion of its value. To measure the impact of price increases, several indexes and "price deflators" to generate "constant dollar" figures are available. These include indexes of producer prices for metal cutting and metal forming machine tools. However, because these indexes are limited in their ability to make adjustments for changes in the qualitative characteristics of machine tools, they should be used with caution.

U.S. machine tool builders have traditionally been active exporters of their products. Until 1978, the U.S. machine tool balance of trade had continuously been positive and had helped offset trade deficits incurred in other sectors. However, a surge in imports in the late 1970's, sparked by unprecedented peacetime machine tool demand, led to the development of a sizable balance of trade deficit. What is troubling is that the competitive impact of machine tool imports is understated in current statistics. The value data for imports exclude important cost elements such as insurance and ocean freight which also affect the balance of payments. These shortcomings of the foreign trade statistics are discussed in Chapter 5, as are other detailed aspects of machine tool foreign trade.

To protect and expand foreign markets many U.S. businesses have established plants in foreign countries. Direct foreign investment increased rapidly during the

1960's and 1970's and U.S. machine tool builders joined this move. While no information is available on machine tool direct foreign investment, data are presented for U.S. direct foreign investments in various countries by all industries and by manufacturing industries.

Definitions and discussions of the terms used in this and other chapters are in the glossary at the end of this book.

THE NATIONAL ECONOMY AND MACHINE TOOLS
1958 to Date

		Shipments in Billion Dollars			Shipments in Million Dollars		
Year	GNP Billion $	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry	Machine Tool Products	Complete Machine Tools
1958	$ 449.7	$ 327.0	$ 162.8	$ 23.4	$ 998	$ 870	$ 591
1959	487.9	363.4	187.3	26.6	1,112	975	616
1960	506.5	370.5	190.6	26.8	1,266	1,126	744
1961	524.6	371.1	187.4	26.6	1,242	1,102	751
1962	565.0	400.3	207.1	29.2	1,430	1,223	821
1963	596.7	420.7	219.4	31.0	1,502	1,370	896
1964	637.7	448.0	235.6	35.3	1,791	1,650	1,164
1965	691.1	491.9	266.7	39.5	2,107	1,955	1,426
1966	756.0	538.4	295.8	46.9	2,554	2,319	1,685
1967	799.6	557.8	303.2	49.2	2,841	2,585	1,806
1968	873.4	603.2	332.4	51.0	2,817	2,500	1,727
1969	944.0	642.5	353.7	56.1	2,835	2,507	1,598
1970	992.7	634.0	338.6	56.5	2,598	2,278	1,443
1971	1,077.6	671.1	359.7	56.0	2,019	1,698	998
1972	1,185.9	756.3	408.3	65.8	2,112	1,929	1,019
1973	1,326.4	875.2	476.2	77.8	2,777	2,596	1,501
1974	1,434.2	1,017.5	530.7	92.5	3,580	3,189	2,031
1975	1,549.2	1,039.1	523.9	95.8	3,834	3,432	2,452
1976	1,716.0	1,185.6	608.3	105.5	3,567	3,197	2,060
1977	1,918.3	1,358.4	711.2	122.2	3,943	3,675	2,281
1978	2,163.9	1,522.9	814.2	143.2	4,978	4,735	3,013
1979	2,417.8	1,727.2	912.7	166.5	6,053	5,762	3,877
1980(r)	2,631.7	1,852.7	930.6	180.7	6,981	6,702	4,692
1981(r)	2,954.1	2,017.5	1,006.5	201.5	7,481	7,206	5,096
1982(r)	3,073.0	1,910.3	922.3	180.6	5,895	5,567	3,604
1983(p)	3,310.5	2,047.4	1,021.5	178.3	NA	NA	1,845

NA - Not Available. p - Preliminary. r - Revised.

Sources: Col. 1: U.S. Department of Commerce, "Business Statistics, 1979" and "Survey of Current Business" (monthly). Cols. 2, 3 and 4: U.S, Bureau of the Census. "Manufacturers' Shipments, Inventories and Orders: 1977-1983" (revised) and Series M3-1 (monthly). Cols. 5 and 6: U.S. Bureau of the Census, "Annual Survey of Manufactures," M (AS)-1 & 2 and 1982 "Census of Manufactures". Col. 7: National Machine Tool Builders' Association, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

The last three columns cover the following three different entities.

Machine Tool Industry: (Standard Industrial Classifications 3541 and 3542). All shipments orginating in establishments whose primary products are machine tools. The figures include other-than-machine tools produced in these establishments as well as miscellaneous receipts.

Machine Tool Products: All machine tool products shipped by the machine tool industry and by other industries. Excludes all shipments of items which are not classified as machine tool products.

Complete Machine Tools: Shipments of complete machine tools, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines, as reported by NMTBA.

THE NATIONAL ECONOMY AND MACHINE TOOLS
Indexes, 1958 to Date
1967 Shipments = 100

Year	GNP	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry (a)	Machine Tool Products (a)	Complete Machine Tools (a)
1958	56.2	58.6	53.7	47.6	35.1	33.7	32.7
1959	61.0	65.1	61.8	54.1	39.1	37.7	34.1
1960	63.3	66.4	62.9	54.5	44.6	43.6	41.2
1961	65.6	66.5	61.8	54.1	43.7	42.6	41.6
1962	70.7	71.8	68.3	59.3	50.3	47.3	45.5
1963	74.6	75.4	72.4	63.0	52.9	53.0	49.6
1964	79.8	80.3	77.7	71.7	63.0	63.8	64.5
1965	86.4	88.2	88.0	80.3	74.2	75.6	79.0
1966	94.5	96.5	97.6	95.3	89.9	89.7	93.3
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1968	109.2	108.1	109.6	103.7	99.2	96.7	95.6
1969	118.1	115.2	116.7	114.0	99.8	97.0	88.5
1970	124.1	113.7	111.7	114.8	91.4	88.1	79.9
1971	134.8	120.3	118.6	113.8	71.1	65.7	55.3
1972	148.3	135.6	134.7	133.7	74.3	74.6	56.4
1973	165.9	156.9	157.1	158.1	97.7	100.4	83.1
1974	179.4	182.4	175.0	188.0	126.0	123.4	112.5
1975	193.7	186.3	172.8	194.7	135.0	132.8	135.8
1976	214.9	212.5	200.6	214.4	125.6	123.7	114.1
1977	239.9	243.5	234.6	248.4	138.8	142.2	126.3
1978	270.6	273.0	268.5	291.1	175.2	183.2	166.8
1979	302.4	309.6	301.0	338.4	213.1	227.9	214.7
1980	329.3	332.1	306.9	367.5	245.7	259.3	259.8
1981	367.4	361.7	332.0	409.6	263.3	278.8	282.2
1982(r)	384.3	342.5	304.2	367.1	207.5	215.4	199.6
1983(p)	414.0	367.0	336.9	362.4	NA	NA	102.2

NA - Not Available.   p - Preliminary.   r - Revised.

(a) See notes on page 4.

Sources: U.S. Department of Commerce, U.S. Bureau of the Census, and NMTBA.

GROSS NATIONAL PRODUCT AND COMPONENTS
1961 to Date

Year	Gross National Product	Personal Consumption Expenditures	Gross Private Domestic Investment	Net Exports of Goods and Services	Government Purchases of Goods and Services
In current dollars (billions)					
1961	$ 524.6	$ 335.0	$ 74.8	$ 6.6	$108.2
1962	585.0	355.2	85.4	6.4	118.0
1963	596.7	374.6	90.9	7.6	123.7
1964	637.7	400.5	97.4	10.1	129.8
1965	691.1	430.4	113.5	8.8	138.4
1966	756.0	465.1	125.7	6.5	158.7
1967	799.6	490.3	122.8	6.3	180.2
1968	873.4	536.9	133.3	4.3	199.0
1969	994.0	581.8	149.3	4.2	208.8
1970	992.7	621.7	144.2	6.7	220.1
1971	1,077.6	672.2	166.4	4.1	234.9
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,326.4	812.0	229.8	14.2	270.4
1974	1,434.2	888.1	228.7	13.4	304.1
1975	1,549.2	976.4	206.1	26.8	339.9
1976	1,718.0	1,084.3	257.9	13.8	362.1
1977	1,918.3	1,204.4	324.1	-4.0	393.8
1978	2,163.9	1,346.5	386.6	-1.1	431.9
1979	2,417.8	1,507.2	423.0	13.2	474.4
1980(r)	2,631.7	1,668.1	401.9	23.9	537.8
1981(r)	2,954.1	1,857.2	474.9	26.3	595.7
1982(r)	3,073.0	1,991.9	414.5	17.4	649.2
1983	3,310.5	2,158.0	471.9	-9.0	689.5
In constant 1972 dollars (billions)					
1961	$ 756.6	$ 461.4	$103.9	$ 8.5	$182.9
1962	800.3	482.0	117.6	7.5	193.2
1963	832.5	500.5	125.1	9.4	197.6
1964	876.4	528.0	133.0	12.8	202.6
1965	929.3	557.5	151.9	10.1	209.8
1966	984.8	585.7	163.0	6.5	229.7
1967	1,011.4	602.7	154.9	5.4	248.5
1968	1,058.1	634.4	161.6	1.9	260.2
1969	1,087.6	657.9	171.4	0.9	257.4
1970	1,085.6	672.1	158.5	3.9	251.1
1971	1,122.4	696.8	173.9	1.6	250.1
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,255.0	768.5	217.5	15.5	253.5
1974	1,248.0	763.6	195.5	27.8	261.2
1975	1,233.9	780.2	154.8	32.2	266.7
1976	1,298.2	823.1	184.5	25.4	265.2
1977	1,369.7	864.3	214.2	22.0	269.2
1978	1,438.6	903.2	236.7	24.0	274.6
1979	1,479.4	927.6	236.3	37.2	278.3
1980(r)	1,475.0	931.8	208.5	50.3	284.3
1981(r)	1,513.8	956.8	227.6	43.0	286.5
1982(r)	1,485.4	970.2	194.5	28.9	291.8
1983	1,535.3	1,011.4	219.0	11.8	293.1

r - Revised.

Note: Individual components may not add to total GNP due to rounding.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

ACTUAL AND PROJECTED GNP AND OTHER ECONOMIC INDICATORS

	Measure	Actual			Projection
		1981(r)	1982(r)	1983(r)	1984
Gross National Product	Bil. $	$2,954.1	$3,073.0	$3,310.5	$3,635.0
GNP in Constant Dollars	Bil. 1972 $	1,513.8	1,485.4	1,535.3	1,614.0
GNP Implicit Price Deflator	1972 = 100	195.1	206.9	215.6	225.0
Industrial Production	1967 = 100	151.0	138.6	147.6	162.0
Unemployment Rate	Percent	7.6%	9.7%	9.6%	7.8%
Corporate Profits After Taxes	Bil. $	$ 144.1	$ 115.1	$ 130.6	$ 154.2
Non-Residential Fixed Investment	Bil. 1972 $	174.4	166.1	168.4	186.0
Change in Business Inventories	Bil. 1972 $	8.5	−9.4	−2.1	11.6
Personal Consumption Expenditures	Bil. 1972 $	956.8	970.2	1,011.4	1,057.0
Federal Government Purchases	Bil. 1972 $	110.4	116.6	117.8	123.5

r - Revised.

Sources: Actual: U.S. Department of Commerce, "Survey of Current Business" (monthly). Projected: American Statistical Association and National Bureau of Economic Research panel of forecasters, "Economic Outlook USA, Spring 1984."

SELECTED PRICE DEFLATORS
1964 to Date

Year	Price Deflators			
	Gross National Product	Personal Consumption Expenditure	Producers' Durable Equipment	Metal-Working Machinery & Equipment
	1972 = 100			
1964	72.8	75.9	80.1	74.3
1965	74.4	77.2	80.6	76.3
1966	76.8	79.4	82.1	79.8
1967	79.1	81.4	84.3	83.2
1968	82.5	84.6	87.2	86.5
1969	86.8	88.4	89.9	89.7
1970	91.4	92.5	93.2	94.8
1971	96.0	96.5	97.2	97.6
1972	100.0	100.0	100.0	100.0
1973	105.7	105.7	101.8	104.4
1974	114.9	116.2	109.3	122.2
1975	125.6	125.2	126.2	142.8
1976	132.3	131.7	133.9	152.0
1977	140.1	139.3	141.0	165.1
1978	150.4	149.1	149.7	180.5
1979	163.4	162.5	158.8	200.7
1980(r)	178.4	179.0	169.1	228.3
1981(r)	195.1	194.1	179.5	250.7
1982(r)	206.9	205.3	183.1	267.0
1983	215.6	213.4	182.9	271.6

r - Revised.

Note: Gross National Product, Personal Consumption Expenditures and Producers' Durable Equipment values are "Implicit Price Deflators;" Metal-Working Machinery and Equipment values are "Producer Price Indices."

Source: U.S. Department of Commerce, "Business Statistics," 1979; "Survey of Current Business" (monthly). U.S. Department of Labor, Bureau of Labor Statistics.

Price deflators are used to express changes over a period of time in constant dollars. The implicit price deflator for GNP is a weighted average of the price indexes used to deflate the components of GNP. It is generally regarded as the best single measure of broad price movements in the economy as a whole.

GROSS NATIONAL PRODUCT AND GOVERNMENT RECEIPTS
Selected Years, 1938 to Date
(Values in Billions of Dollars)

Year	GNP	Total Gov't Receipts	Percent of GNP	Federal Gov't Receipts	Percent of GNP	State & Local Gov't Receipts	Percent of GNP
1938	$ 85.0	$ 15.0	17.7%	$ 6.5	7.7%	$ 9.3	10.9%
1945	212.4	53.2	25.1	42.5	20.0	11.6	5.5
1950	286.5	69.0	24.1	50.0	17.5	21.3	7.4
1955	400.0	101.1	25.3	72.6	18.2	31.7	7.9
1960	506.5	139.5	27.5	96.1	19.0	49.9	9.9
1965	691.1	188.3	27.3	124.3	18.0	75.1	10.9
1970	992.7	302.8	30.5	191.9	19.3	135.4	13.6
1973	1,326.4	413.1	31.1	258.6	19.5	195.0	14.7
1974	1,434.2	455.2	31.7	287.8	20.1	211.4	14.7
1975	1,549.2	470.5	30.1	287.3	18.5	237.7	15.3
1976	1,718.0	538.4	31.3	331.8	19.3	267.8	15.6
1977	1,918.3	605.4	31.6	375.2	19.6	297.7	15.5
1978	2,163.9	681.9	31.5	431.6	19.9	327.6	15.1
1979	2,417.8	765.1	31.6	493.6	20.4	352.0	14.6
1980(r)	2,631.7	838.3	31.9	540.9	20.6	386.1	14.7
1981(r)	2,954.1	957.2	32.4	627.0	21.2	418.1	14.2
1982(r)	3,073.0	972.5	31.6	617.4	20.1	439.1	14.3
1983(p)	3,310.5	1,040.1	31.4	643.3	19.4	463.3	14.6

p - Preliminary.   r - Revised.

Note: Federal grants-in-aid to State and local governments are reflected in State and local receipts. Total government receipts have been adjusted to eliminate this duplication.

Source: "Economic Report of the President," February, 1984, and earlier editions. U.S. Department of Commerce, "Survey of Current Business" (monthly).

CORPORATE PROFITS AND TAX
Selected Years, 1938 to Date
(Billions of Dollars)

Year	Corporate Profits Before Taxes	Profits Tax Liability	Profits After Tax	Net Dividend Payments	Undistributed Profits
1938	$ 4.0	$ 1.0	$ 2.9	$ 3.2	$ 0.2
1945	19.7	10.7	9.0	4.6	4.4
1950	42.6	17.9	24.7	8.8	15.9
1955	48.4	22.0	26.4	10.3	16.1
1960	48.5	22.7	25.8	12.9	13.0
1965	75.2	30.9	44.3	19.1	25.2
1970	71.5	34.5	37.0	22.9	14.1
1973	115.8	48.7	67.1	27.8	39.3
1974	126.9	52.4	74.5	31.0	43.6
1975	120.4	49.8	70.6	31.9	38.7
1976	152.0	63.8	88.2	29.1	59.1
1977	179.6	72.7	106.9	30.5	76.4
1978	209.4	83.2	126.2	36.5	89.7
1979	222.1	87.6	134.5	37.6	96.9
1980(r)	204.7	84.8	119.9	40.4	79.5
1981(r)	203.3	82.8	120.5	50.3	70.2
1982(r)	152.4	59.2	93.2	54.4	38.8
1983(p)	186.1	76.9	109.2	61.8	47.4

p - Preliminary.   r - Revised.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

THE FEDERAL BUDGET
Fiscal Years, 1930 to Date
(Billions of Dollars)

Year	Receipts	Outlay	Surplus or Deficit (−)	Year	Receipts	Outlay	Surplus or Deficit (−)
1930	$ 4.1	$ 3.3	$ 0.7	1960	$ 92.5	$ 92.2	$ 0.3
1931	3.1	3.6	−0.5	1961	94.4	97.8	−3.4
1932	1.9	4.7	−2.7	1962	99.7	106.8	−7.1
1933	2.0	4.6	−2.6	1963	106.6	111.3	−4.8
1934	3.0	6.6	−3.6	1964	112.7	118.6	−5.9
1935	3.7	6.5	−2.8	1965	116.8	118.4	−1.6
1936	4.0	8.4	−4.4	1966	130.9	134.7	−3.8
1937	5.0	7.7	−2.8	1967	148.9	157.6	−8.7
1938	5.6	6.8	−1.2	1968	153.0	178.1	−25.2
1939	5.0	8.8	−3.9	1969	186.9	183.6	3.2
1940	6.4	9.5	−3.1	1970	192.8	195.7	−2.8
1941	8.6	13.6	−5.0	1971	187.1	210.2	−23.0
1942	14.4	35.1	−20.8	1972	207.3	230.7	23.4
1943	23.6	78.5	−54.9	1973	230.8	245.6	−14.8
1944	44.3	91.3	−47.0	1974	263.2	267.9	−4.7
1945	45.2	92.7	−47.5	1975	279.1	324.2	−45.2
1946	39.3	55.2	−15.9	1976	298.1	364.5	−66.4
1947	38.4	34.5	3.9	Tr. Qtr.	81.2	94.2	−13.0
1948	41.8	29.8	12.0	1977	355.6	400.5	−44.9
1949	39.4	38.8	0.6	1978	399.6	448.4	−48.8
1950	39.5	42.6	−3.1	1979	463.3	491.0	−27.7
1951	51.6	45.5	6.1	1980	517.1	576.7	−59.6
1952	66.2	67.7	−1.5	1981	599.3	657.2	−57.9
1953	69.6	76.1	−6.5	1982	617.8	728.4	−110.6
1954	69.7	70.9	−1.2	1983(r)	600.6	796.0	−195.4
1955	65.5	68.5	−3.0	1984E	670.1	853.8	−183.7
1956	74.5	70.5	4.1	1985E	745.1	925.5	−180.4
1957	80.0	76.7	3.2				
1958	79.6	82.6	−2.9				
1959	79.2	92.1	−12.9				

E - Estimate. r - Revised.

Tr. Qtr.—Transition Quarter: Beginning with the 1977 Federal Budget, the fiscal year runs from October 1 through September 30. To facilitate the conversion, a three-month transition period was provided between fiscal years 1976 and 1977.

Note: 1930 to 1939: Administrative Budget: 1940 to 1953: Consolidated Cash Statement: 1954 to Date: Unified Budget.

Source: "Economic Report of the President," February 1984 and earlier editions.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT
1959 to Date
(Values in Billions of Current Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1959	$ 487.9	$ 45.9	9.4%	$ 28.3	5.8%
1960	506.5	48.5	9.6	29.7	5.9
1961	524.6	48.0	9.1	28.9	5.5
1962	565.0	52.2	9.2	32.1	5.7
1963	596.7	54.8	9.2	34.4	5.8
1964	637.7	61.0	9.6	38.7	6.1
1965	691.1	72.7	10.5	45.8	6.6
1966	756.0	83.1	11.0	53.0	7.0
1967	799.6	83.9	10.5	53.7	6.7
1968	873.4	90.6	10.4	58.2	6.7
1969	994.0	101.3	10.2	64.6	6.5
1970	992.7	103.9	10.5	65.1	6.6
1971	1,077.6	107.9	10.0	67.4	6.3
1972	1,185.9	121.0	10.2	76.8	6.5
1973	1,326.4	143.3	10.8	92.3	7.0
1974	1,434.2	156.6	10.9	100.6	7.0
1975	1,549.2	157.7	10.2	102.3	6.6
1976	1,718.0	174.1	10.1	115.2	6.7
1977	1,918.3	205.2	10.7	140.8	7.3
1978	2,163.9	248.9	11.5	170.2	7.9
1979	2,417.8	290.2	12.0	191.9	7.9
1980(r)	2,631.7	308.8	11.7	197.9	7.5
1981(r)	2,954.1	352.2	11.9	218.8	7.4
1982(r)	3,073.0	348.3	11.3	206.4	6.7
1983(p)	3,310.5	348.4	10.5	217.2	6.6

p - Preliminary. r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

Gross private fixed nonresidential domestic investment includes capital expenditures by the domestic business sector for (1) new and replacement construction (e.g., buildings, stores, and warehouses) and (2) producers' durable equipment. Expenditures for producers' durable equipment include the new and replacement purchases of automobiles, trucks, various types of machinery, and other equipment used by the private sector in the production of goods and services.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT IN CONSTANT DOLLARS

1948 to Date

(Values in Billions of 1972 Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1948	$ 489.8	$ 51.1	10.4%	$ 32.6	6.6%
1949	492.2	46.0	9.3	28.1	5.7
1950	534.8	50.0	9.3	30.8	5.8
1951	579.4	52.9	9.1	32.2	5.6
1952	600.8	52.1	8.7	31.5	5.2
1953	623.6	56.3	9.0	33.7	5.4
1954	616.1	55.4	9.0	31.8	5.2
1955	657.5	61.3	9.3	35.9	5.5
1956	671.6	65.4	9.7	37.0	5.5
1957	683.8	66.2	9.7	37.8	5.5
1958	680.9	59.3	8.7	32.5	4.8
1959	721.7	63.6	8.8	36.2	5.0
1960	737.2	66.9	9.1	37.4	5.1
1961	756.6	66.7	8.8	36.5	4.8
1962	800.3	72.0	9.0	40.4	5.0
1963	832.5	75.1	9.0	43.1	5.2
1964	876.4	82.7	9.4	48.3	5.5
1965	929.3	97.4	10.5	56.8	6.1
1966	984.8	108.0	11.0	64.5	6.5
1967	1,011.4	105.6	10.4	63.6	6.2
1968	1,058.1	109.5	10.3	66.8	6.3
1969	1,087.6	116.8	10.7	71.8	6.6
1970	1,085.6	113.8	10.5	69.9	6.4
1971	1,122.4	112.2	9.2	69.3	5.7
1972	1,185.9	121.0	10.2	76.9	6.5
1973	1,255.0	138.1	11.0	90.7	7.2
1974	1,248.0	135.7	10.9	92.1	7.4
1975	1,233.9	119.3	9.7	81.1	6.6
1976	1,298.2	125.6	9.7	86.1	6.6
1977	1,369.7	140.3	10.2	99.9	7.3
1978	1,438.6	158.3	11.0	113.7	7.9
1979	1,479.4	169.9	11.5	120.8	8.2
1980(r)	1,475.0	165.8	11.2	117.0	7.9
1981(r)	1,513.8	174.4	11.5	121.9	8.1
1982(r)	1,485.4	166.1	11.2	112.7	7.6
1983(p)	1,535.3	168.4	11.0	118.8	7.7

p - Preliminary.   r - Revised.

Sources: U.S. Department of Commerce, "Business Statistics, 1977"; "Survey of Current Business" (monthly).

U.S. BALANCE OF TRADE
1964 to Date

Year	All Merchandise Billions of Dollars			Machine Tools and Parts Millions of Dollars		
	Exports	Imports	Net Balance	Exports	Imports	Net Balance
1964	$ 25.5	$ 18.7	$ 6.8	$ 300.8	$ 45.6	$ 255.2
1965	26.5	21.5	5.0	287.2	68.9	218.3
1966	29.3	25.5	3.8	273.6	137.4	136.2
1967	30.7	26.9	3.8	294.5	203.7	90.8
1968	33.6	33.0	.6	286.0	191.3	94.7
1969	36.4	35.8	.6	323.5	182.5	140.9
1970	42.0	39.8	2.2	403.9	158.5	245.4
1971	42.8	45.5	-2.7	351.0	109.6	241.4
1972	48.8	55.8	-7.0	332.1	141.8	190.3
1973	71.4	70.4	1.0	443.0	211.6	231.4
1974	98.3	103.7	-5.4	566.5	330.3	236.2
1975	107.1	98.0	9.1	705.9	382.4	323.5
1976	114.4	123.4	-9.0	682.8	383.3	299.5
1977	119.7	150.2	-30.5	579.6	482.2	97.4
1978	140.9	174.5	-33.6	738.6	832.4	-93.7
1979	179.2	209.4	-30.2	878.6	1,269.5	-390.9
1980(r)	220.1	244.2	-24.1	1,099.2	1,556.9	-457.7
1981(r)	232.6	261.1	-28.5	1,445.6	1,712.9	-267.3
1982(r)	209.2	244.5	-35.3	1,002.4	1,489.4	-487.0
1983(p)	199.4	258.9	-59.5	691.9	1,100.2	-408.3

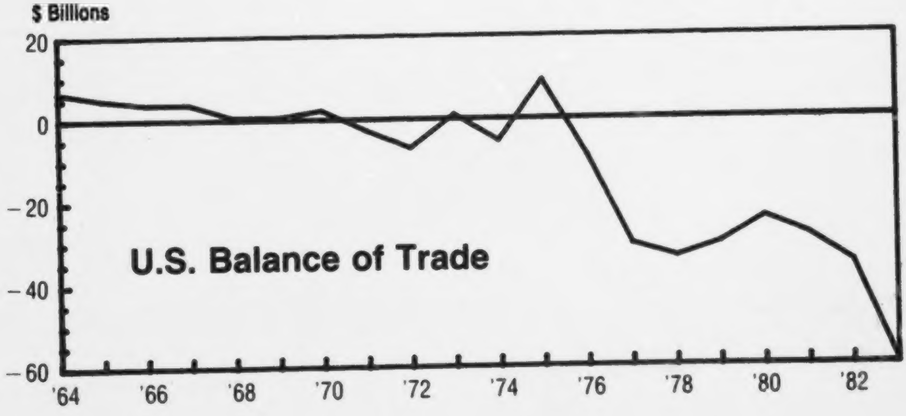
p - Preliminary. r - Revised.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metal working machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Individual items may not add to totals due to rounding.

Source: All merchandise: U.S. Department of Commerce, "Survey of Current Business," (monthly); Machine Tools: U.S. Bureau of the Census, "EM 522" and "IM 146."

For details on how the values in the above table are computed, see the text introduction to Chapter 5.



VALUE OF U.S. DIRECT FOREIGN INVESTMENTS
Book Value at Year End, 1977 to 1982
(Millions of U.S. Dollars)

	1977	1978	1979	1980(r)	1981(r)	1982(p)
World:						
Total All Industries	$145,990	$162,727	$187,858	$215,375	$226,359	$221,343
Manufacturing	62,019	69,669	79,023	89,290	92,386	90,685
Canada:						
Total All Industries	35,052	36,396	40,662	45,119	45,129	44,509
Manufacturing	14,795	15,736	17,531	19,028	19,812	19,730
United Kingdom:						
Total All Industries	16,709	19,527	23,696	28,460	30,260	30,785
Manufacturing	8,310	9,483	11,447	13,833	13,093	12,924
European Economic Community:						
Total All Industries	32,441	36,464	42,379	49,040	50,386	47,559
Manufacturing	19,096	22,013	24,506	27,633	28,119	27,375
Other Western Europe:						
Total All Industries	13,401	14,656	16,981	18,787	20,868	21,533
Manufacturing	3,064	3,159	3,676	3,821	4,065	3,827
Japan:						
Total All Industries	4,593	5,406	6,180	6,225	6,755	6,872
Manufacturing	1,968	2,343	2,777	2,954	3,236	3,456
Australia, New Zealand, & South Africa:						
Total All Industries	7,923	8,781	9,579	10,583	11,998	11,818
Manufacturing	3,242	3,559	3,946	4,205	4,703	4,116
Latin America:						
Total All Industries	27,514	31,770	35,220	38,761	38,864	33,039
Manufacturing	9,614	11,153	12,440	14,590	15,811	15,625
Other Areas:						
Total All Industries	8,356	9,727	13,161	18,400	22,099	25,228
Manufacturing	1,931	2,224	2,700	3,226	3,547	3,632

p - Preliminary.   r - Revised.

Source: U.S. Department of Commerce, "Survey of Current Business," (August).

Direct foreign investments include purchases and sales of equity interest in foreign enterprises and capital movements between U.S. corporations and their foreign affiliates.

ESTIMATES OF CAPITAL EXPENDITURES* BY MAJORITY-OWNED FOREIGN AFFILIATES OF U.S. COMPANIES, BY SELECTED COUNTRY OR AREA

(Millions of U.S. Dollars)

	Actual						Projection	
	1977	1978	1979	1980	1981	1982(r)	1983(r)	1984
WORLD								
Total Manufacturing	$10,522	$11,959	$15,419	$19,540	$19,164	$16,755	$13,757	$16,029
Mchy., Except Elec.	2,968	3,630	4,749	5,589	5,106	4,900	3,480	3,719
CANADA								
Total Manufacturing	2,275	2,405	2,776	3,728	3,800	2,740	2,468	2,786
Mchy., Except Elec.	283	340	403	499	649	601	422	343
LATIN AMERICA								
Total Manufacturing	1,355	1,491	1,957	2,760	3,114	2,703	1,983	2,359
Mchy., Except Elec.	191	290	257	411	422	369	216	337
EUROPE								
Total Manufacturing	5,875	6,841	9,224	11,127	10,273	9,274	7,613	8,730
Mchy., Except Elec.	2,164	2,638	3,694	4,099	3,423	3,249	2,374	2,630
UNITED KINGDOM								
Total Manufacturing	1,447	1,780	2,596	3,005	2,591	2,529	2,081	2,326
Mchy., Except Elec.	455	527	834	784	735	635	479	598
FRANCE								
Total Manufacturing	1,041	1,072	1,273	1,582	1,316	1,323	1,143	1,239
Mchy., Except Elec.	571	620	790	977	821	868	607	624
FEDERAL REP. OF GERMANY								
Total Manufacturing	1,495	2,122	2,826	3,233	2,653	2,306	2,019	2,498
Mchy., Except Elec.	571	828	1,137	1,174	959	894	617	731
ITALY								
Total Manufacturing	418	522	634	870	797	696	638	629
Mchy., Except Elec.	D	D	D	D	D	D	D	250
ASIA AND PACIFIC								
Total Manufacturing	596	718	919	1,281	1,237	1,327	1,073	1,376
Mchy., Except Elec.	22(a)	331	355	34(a)	47(a)	57(a)	61(a)	58(a)
JAPAN								
Total Manufacturing	325	401	462	707	666	765	503	583
Mchy., Except Elec.	D	314	337	D	D	D	D	D
SOUTH AFRICA								
Total Manufacturing	67	61	87	117	147	211	178	206
Mchy., Except Elec.	D	8	11	18	19	18	11	D
AUSTRALIA								
Total Manufacturing	314	375	381	453	512	424	370	489
Mchy., Except Elec.	18	21	28	D	D	29	25	26

D - Withheld to avoid disclosure. r - Revised.

(a) Excludes Japan.

* - "Capital expenditures" previously were referred to as "property, plant, and equipment expenditures." They represent gross outlays charged to capital accounts to acquire, add to, or improve real property, plant, and equipment. Sales or other dispositions of fixed assets are not netted against these outlays.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

EXPENDITURES ON NEW PLANT AND EQUIPMENT
Major Industries, Selected Years, 1960 to Date

(Billions of Dollars)

Year	All Industries	Total Manufacturing Industries	Durable Goods Industries	Electrical Machinery and Equipment	Non-electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment
1960	$ 48.63	$ 16.36	$ 8.28	$ 1.02	$ 1.21	$ 1.48	$0.46
1965	70.44	25.41	13.49	1.68	2.24	3.00	0.74
1968	88.45	32.33	17.93	3.17	2.90	2.67	1.57
1969	99.53	36.27	19.97	3.27	3.63	2.99	1.81
1970	105.61	36.99	19.80	3.49	3.79	3.05	1.61
1971	108.52	33.60	16.78	3.04	3.15	2.42	1.13
1972	120.25	35.42	18.22	2.83	3.24	3.01	1.40
1973	137.69	42.37	22.74	3.50	3.97	3.83	1.83
1974	156.98	53.21	27.44	3.85	5.22	4.31	2.56
1975	157.71	54.92	26.33	3.14	4.96	3.35	2.57
1976	171.45	59.94	28.48	3.65	5.52	3.62	2.77
1977	198.08	69.23	34.05	4.68	6.59	5.83	3.22
1978	231.24	79.72	40.44	5.69	7.21	7.22	4.79
1979	270.45	98.68	51.07	7.28	10.52	8.31	7.01
1980	295.63	115.81	58.91	9.59	11.59	9.06	9.10
1981	321.49	126.79	61.84	10.31	13.22	10.08	8.31
1982	316.43	119.68	56.44	10.62	12.89	7.92	7.24
1983(r)	302.50	111.53	51.78	10.90	12.35	7.17	5.85
1984E	343.57	129.72	62.78	13.48	14.73	9.61	7.04

E - Estimate. r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business," (monthly), Estimate, "Survey of Current Business," (March).

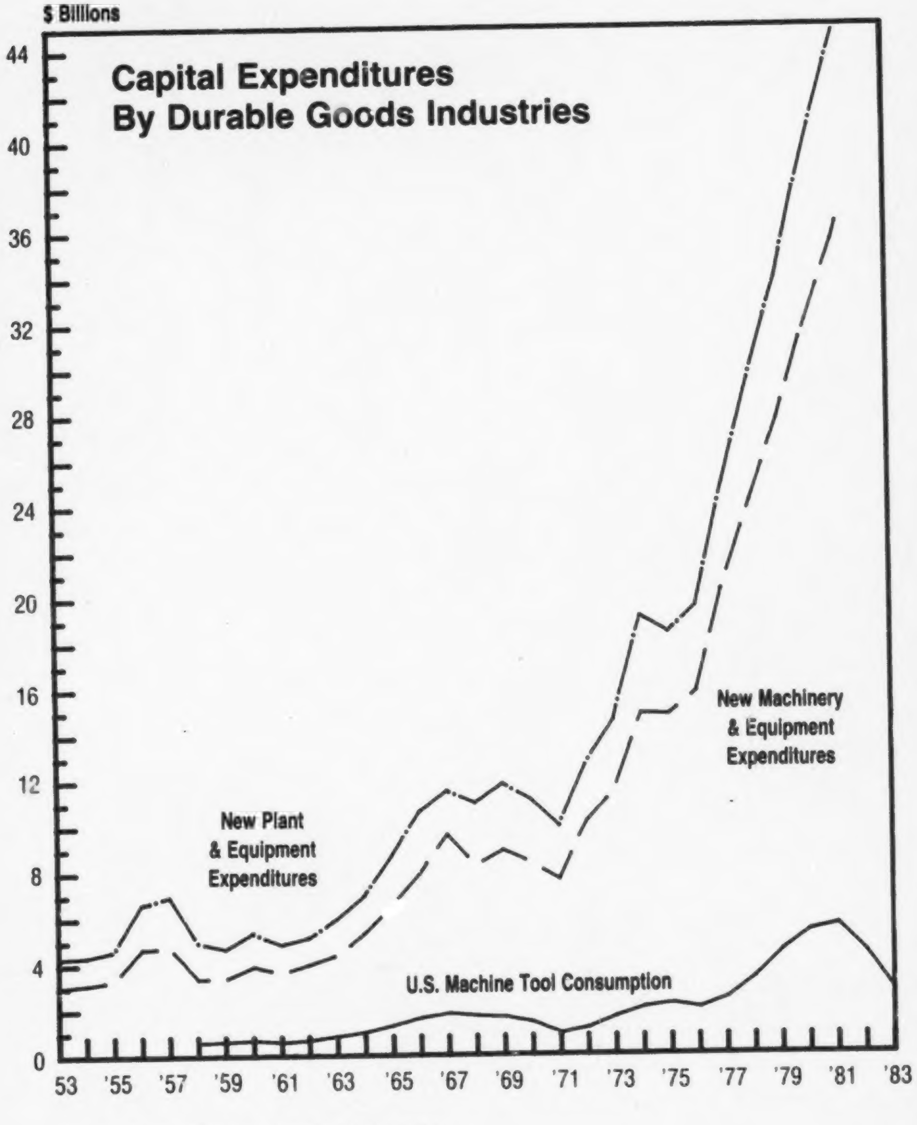
NEW PLANT AND EQUIPMENT PROJECTS
Starts During Year and Carry-Over at Year End, 1965 to Date

(Billions of Dollars)

	Total Manufacturing		Durables		Electrical Machinery		Nonelectrical Machinery		Transportation Equipment		Public Utilities	
Year	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over
1965	$ 31.12	$20.02	$17.14	$11.00	$ 2.32	$1.64	$ 2.75	$1.04	$ 4.82	$ 3.07	$ 8.82	$ 7.67
1967	30.31	20.96	16.10	12.07	3.05	2.51	2.70	1.08	3.87	2.67	13.53	14.12
1968	33.81	22.44	18.43	12.57	2.91	2.26	2.81	.99	4.90	3.32	12.68	16.28
1969	39.80	25.97	21.65	14.25	4.59	3.58	3.82	1.18	4.86	3.38	14.85	19.43
1970	33.82	22.81	17.41	11.86	2.91	2.99	3.66	1.06	4.12	2.85	16.76	23.16
1971	31.78	20.99	15.86	10.93	2.35	2.31	2.98	.89	3.78	3.09	20.69	29.15
1972	38.97	24.54	19.30	12.01	2.63	2.10	3.39	1.04	4.74	3.42	29.77	42.65
1973	53.21	35.38	28.07	17.33	4.12	2.72	4.43	1.50	7.02	4.79	36.22	60.91
1974	61.24	43.41	31.07	21.59	3.55	2.42	6.20	2.47	7.11	5.03	47.72	88.79
1975	56.51	45.00	23.71	18.98	2.59	1.88	5.33	2.84	4.40	3.52	39.32	108.14
1976	59.38	44.44	29.80	20.30	4.27	2.49	6.20	3.52	6.64	3.77	28.09	113.86
1977	77.40	52.62	36.59	22.85	4.80	2.62	6.84	3.77	10.63	5.33	34.53	121.60
1978	88.16	61.05	46.20	28.62	6.27	3.20	7.71	4.27	15.62	8.94	38.74	130.39
1979	112.98	75.35	59.18	36.72	8.16	4.06	12.66	6.41	19.01	12.63	21.67	118.10
1980	123.32	85.16	57.67	36.92	10.25	5.11	10.72	5.81	16.50	11.42	43.69	130.16
1981	135.19	93.73	68.89	44.37	11.50	6.49	15.95	8.75	19.35	12.26	34.98	126.04
1982(r)	104.35	79.21	45.73	33.25	8.97	4.75	11.02	6.73	13.87	10.97	15.11	99.48
1983	114.51	82.04	53.28	34.90	12.49	6.33	12.62	7.06	13.55	11.50	26.98	85.46

r - Revised.

Source: U.S. Department of Commerce, "Survey of Current Business" (March).



Source: U.S. Bureau of Census & NMTBA

EXPENDITURES ON NEW PLANT AND EQUIPMENT BY DURABLE GOODS INDUSTRIES AND MACHINE TOOL CONSUMPTION

1953 to Date

	New Plant & Equipment Expenditures Billions of Dollars				U.S. Machine Tool Consumption (c) (Mil. Dollars)	Machine Tool Consumption As a % of		
	BEA (a)	Census (b)				BEA (a)	Census (b)	
Year	Total	Total	Plant	Equipment		Total	Total	Equipment
1953	$ 5.31	$ 4.26	$1.25	$ 3.01	NA	NA	NA	NA
1954	4.91	4.32	1.20	3.12	NA	NA	NA	NA
1955	5.41	4.59	1.28	3.31	NA	NA	NA	NA
1956	7.45	6.62	1.95	4.67	NA	NA	NA	NA
1957	7.84	6.94	2.20	4.74	NA	NA	NA	NA
1958	5.61	4.94	1.33	3.61	$ 554.9	9.9%	NA	NA
1959	6.73	4.64	1.29	3.35	587.1	8.7	13.6%	18.8 %
1960	8.28	5.34	1.47	3.87	634.0	7.7	12.3	16.9
1961	7.42	4.81	1.21	3.60	544.4	7.3	12.3	16.4
1962	7.81	5.12E	1.17E	3.95E	625.0	8.0	13.5	17.4
1963	8.64	5.92	1.55	4.37	798.3	9.2	14.7	19.9
1964	10.99	6.95	1.64	5.31	967.2	8.8	15.1	19.7
1965	13.49	8.70	2.18	6.52	1,263.5	9.4	15.4	20.6
1966	17.23	10.61E	2.72E	7.89E	1,588.9	9.2	15.6	21.0
1967	17.82	11.52	1.92	9.60	1,780.0	10.0	16.1	19.3
1968	17.93	10.97	2.71	8.26	1,669.8	9.3	15.6	20.7
1969	19.97	11.81	2.90	8.91	1,605.9	8.0	14.1	18.7
1970	19.80	11.11	2.74	8.37	1,391.5	7.0	13.0	17.3
1971	16.78	9.96	2.34	7.62	896.4	5.3	9.6	12.6
1972	18.22	12.70	2.56	10.14	1,145.1	6.3	9.5	12.0
1973	22.74	14.58	3.15	11.43	1,629.4	7.2	11.9	15.1
1974	27.44	19.13	4.26	14.87	2,026.2	7.4	11.1	14.3
1975	26.33	18.42	3.60	14.82	2,187.0	8.3	12.5	15.5
1976	28.48	19.57	3.75	15.82	1,981.6	7.0	11.0	13.6
1977	34.05	24.93	4.41	20.52	2,427.6	7.1	10.3	12.5
1978	40.44	29.66	5.52	24.14	3,324.8	8.2	11.3	13.9
1979	51.07	33.91	6.22	27.69	4,488.7	8.8	13.9	17.1
1980	58.91	39.42	7.62	31.80	5,338.0	9.1	13.8	17.1
1981	61.84	44.75	7.83	36.91	5,593.2	9.0	13.1	15.9
1982(r)	56.44	NA	NA	NA	4,392.1	7.8	NA	NA
1983	51.78	NA	NA	NA	2,694.7	5.2	NA	NA

NA - Not Available. E - Estimate. r - Revised.

(a) Bureau of Economic Analysis: covers all establishments (Manufacturing and Nonmanufacturing) operated by Manufacturing companies.

(b) Bureau of the Census: covers all Manufacturing establishments.

(c) U.S. domestic machine tool shipments plus imports.

Source: Bureau of Economic Analysis, U.S. Department of Commerce, "Survey of Current Business;" Bureau of the Census, "Annual Survey of Manufactures," M(AS)-5, Expenditures for New Plant and New Equipment; U.S. Bureau of the Census, "FT 135" and earlier reports; and National Machine Tool Builders' Association.

The last three columns in the above table show the percentage of investment for machine tools has declined since the 1960's. The U.S. share of machine tool investment has declined even more because imports have increased their share of the U.S. machine tool market. See the table in the beginning of chapter 5 on machine tool imports as a percentage of U.S. consumption.

EXPENDITURES FOR NEW MACHINERY AND EQUIPMENT

By Major Machine Tool Consuming Industries, 1947 to Date

(Millions of Dollars)

Year	Durable Goods Industries	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles & Equipment (a)	Aircraft & Parts
1947	NA	$ 212.7	$ 312.5	$ 179.7	$ 75.5	$ 18.8
1948	NA	NA	NA	NA	NA	NA
1949	NA	167.8	214.5	133.5	147.9	27.2
1950	NA	223.9	213.0	145.4	216.0	S
1951	NA	246.0	348.5	192.7	290.5	79.7
1952	NA	238.9	342.5	215.9	270.5	77.9
1953	$ 3,010	288.9	404.1	258.8	406.9	83.4
1954	3,120	323.2	425.5	247.6	621.0	87.8
1955	3,309	335.0	440.6	262.3	484.9	115.7
1956	4,669	361.1	545.3	342.3	854.9	181.4
1957	4,740	398.2	553.6	348.4	581.0	209.7
1958	3,605	316.8	487.0	311.1	271.0	129.2
1959	3,350	357.4	399.6	375.2	310.5	128.3
1960	3,866	360.4	435.1	449.0	371.0	124.4
1961	3,600	314.3	416.6	424.0	319.4	149.7
1962	3,946	390.2	447.8	476.4	366.4	189.4
1963	4,366	460.1	612.1	525.9	510.4	191.8
1964	5,306	549.4	713.3	568.2	712.0	204.6
1965	6,520	612.0	960.3	810.5	889.9	206.3
1966	7,889	725.6	1,157.2	1,019.6	893.9	414.7
1967	9,595	834.2	1,361.5	1,087.9	643.0	546.6
1968	8,256	799.5	1,299.8	1,061.3	632.0	463.8
1969	8,905	951.9	1,449.7	1,239.2	781.2	479.0
1970	8,365	872.0	1,377.3	1,134.6	731.7	292.9
1971	7,619	808.6	1,292.7	1,081.1	620.4	197.5
1972	10,139	1,030.7	1,478.2	1,123.4	1,921.3	139.8
1973	11,432	1,345.4	1,791.2	1,567.9	1,625.3	197.6
1974	14,868	1,470.4	2,456.8	1,899.9	2,087.5	227.6
1975	14,821	1,628.9	2,571.6	1,519.1	1,653.6	286.7
1976	15,822	1,724.8	2,611.1	1,816.5	1,908.1	350.6
1977	20,525	2,280.8	3,502.5	2,360.2	3,195.4	417.5
1978	24,142	2,494.4	4,427.7	2,937.9	3,968.6	575.1
1979	27,689	2,741.6	5,326.0	3,650.3	4,243.4	936.4
1980	31,803	3,219.8	6,086.1	4,780.1	4,752.6	1,262.7
1981	36,912	3,791.8	7,040.1	5,098.1	7,539.0	1,325.4

NA - Not Available.   S - Estimate did not meet publication standards.

(a) Beginning in 1972, expenditures for special automotive tools (such as dies, die sets, jigs, fixtures, etc.) are included as capital expenditures. For transition information, special tooling expenditures amount to $1.2 billion for 1972 and $840 million for 1973.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures, M(AS)-5, Expenditures for New Plant and New Equipment".

CAPITAL FORMATION IN MANUFACTURING INDUSTRIES
Selected Years, 1950 to Date
(Billions of Dollars)

	Purchases		Depreciation (a)		Net Investment (b)		Net Value (c)	
Year	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment
In Current Dollars								
1950	$ 6.1	$ 4.3	$ 4.7	$ 3.0	$ 1.4	$ 1.3	$ 55.1	$ 26.4
1955	9.3	6.3	7.3	5.0	2.0	1.3	77.0	41.0
1960	10.8	7.8	10.0	7.3	.8	.5	95.6	54.7
1965	18.3	13.8	12.0	8.8	6.3	5.0	116.4	68.2
1969	23.8	17.4	17.3	12.9	6.5	4.5	175.7	103.7
1970	23.8	17.5	18.9	14.0	4.9	3.5	191.2	112.3
1971	22.5	16.6	20.3	14.9	2.2	1.7	201.3	117.7
1972	25.8	19.9	21.4	15.7	4.4	4.2	213.4	124.0
1973	29.0	22.4	23.0	16.7	6.0	5.7	236.1	136.0
1974	38.3	29.3	26.5	19.0	11.8	10.3	292.7	170.4
1975	39.8	31.6	31.6	23.3	8.2	8.3	319.3	198.2
1976	43.4	34.7	34.5	26.1	8.9	8.6	343.9	219.0
1977	51.2	41.8	38.5	29.5	12.7	12.3	387.3	248.8
1978	58.2	46.6	43.2	33.2	15.0	13.4	438.2	281.0
1979	74.1	58.9	50.1	38.5	24.0	20.4	508.8	328.1
1980(r)	77.2	60.5	58.0	44.6	19.2	15.9	579.7	377.7
1981(r)	82.3	64.2	65.6	51.3	16.7	12.9	640.3	423.2
1982(r)	72.8	54.4	71.5	56.5	3.1	14.4	666.9	443.4
1983	68.1	54.5	75.2	59.7	—4.5	—2.4	676.9	452.3
In 1972 Dollars								
1950	$12.4	$ 8.2	$ 9.5	$ 5.9	$ 2.9	$ 2.3	$106.4	$ 50.2
1955	16.6	10.2	12.2	8.2	4.4	2.0	127.1	64.6
1960	15.6	10.3	14.1	9.6	1.5	.7	140.4	71.9
1965	24.5	17.3	15.9	11.1	8.6	6.2	158.1	84.8
1969	27.5	19.3	19.7	14.2	7.8	5.1	196.7	111.9
1970	25.9	18.5	20.4	14.8	5.5	3.7	202.2	115.8
1971	23.1	16.9	20.9	15.2	2.2	1.7	204.6	117.8
1972	25.8	19.9	21.4	15.7	4.4	4.2	209.2	122.2
1973	27.9	21.8	22.1	16.3	5.8	5.5	215.3	128.0
1974	33.4	26.3	23.0	17.1	10.4	9.2	225.9	137.4
1975	30.4	24.5	24.0	18.0	6.4	6.5	232.7	144.3
1976	31.6	25.3	25.0	19.0	6.6	6.3	239.7	151.1
1977	35.3	28.9	26.2	20.1	9.1	8.8	249.2	160.3
1978	37.6	30.5	27.6	21.5	10.0	9.0	259.5	169.7
1979	44.5	36.4	29.4	23.1	15.1	13.3	275.1	183.3
1980(r)	42.7	34.7	31.3	25.0	11.4	9.7	287.0	193.6
1981(r)	42.8	34.6	33.0	26.6	9.8	8.0	297.3	202.2
1982(r)	37.1	29.0	34.6	28.0	3.5	2.3	301.3	205.0
1983	34.8	29.0	35.8	29.2	.3	1.2	302.2	206.7

r - Revised.

(a) Straight-line depreciation.

(b) Represents the difference between the purchase and depreciation series.

(c) Represents net value in preceding year plus net investment based on straight-line depreciation for year shown.

(d) Total includes equipment and structures.

Source: U.S. Bureau of Economic Analysis.

Data refer to privately owned manufacturing industries and are based on the fixed capital formation components of the gross national product. Stocks are as of end of year; investment and depreciation are annual totals.

CAPITAL APPROPRIATIONS AND BACKLOG OF UNSPENT APPROPRIATIONS (a)

By Selected Industry Groups, 1961 to Date

	All Manufacturing		Durables		Non-Electrical Machinery	
Year	Approp.	Backlog	Approp.	Backlog	Approp.	Backlog
In Current Dollars (Billions)						
1961	$ 10.1	$ 8.1	$ 4.0	$ 4.1	$ 0.8	$1.0
1962	11.7	8.5	5.4	4.5	0.8	0.9
1963	13.3	10.5	6.4	5.6	0.9	1.0
1964	17.9	14.0	8.7	7.2	1.4	1.1
1965	22.3	17.9	11.6	9.4	2.1	1.3
1966	25.4	20.2	14.0	11.4	2.8	1.5
1967	23.9	19.9	12.0	11.0	2.5	1.4
1968	24.8	20.9	12.6	11.5	2.4	1.3
1969	29.5	23.4	15.0	12.4	3.0	1.3
1970	25.3	20.9	12.4	10.8	3.1	1.2
1971	23.1	18.9	11.2	9.4	2.7	1.3
1972	28.8	23.3	14.1	11.8	3.2	1.8
1973	42.9	37.1	21.6	18.7	4.3	2.6
1974	53.7	49.8	24.9	22.7	5.8	3.8
1975	45.0	46.4	16.2	18.1	3.7	3.5
1976	50.0	47.5	22.4	21.0	5.0	4.0
1977	63.4	56.5	26.6	24.6	5.1	4.2
1978	67.2	63.4	33.1	31.1	6.3	5.0
1979(r)	88.5	76.5*	43.3	38.8*	10.2	6.9*
1980	104.6	90.7*	44.3	40.8*	9.4	6.5*
1981(r)	107.0	92.5*	42.1	39.6*	12.7	8.6*
1982(r)	87.5	70.8*	32.0	27.0*	8.7	5.4*
1983(p)	88.1	73.7*	37.5	29.8*	7.9	5.3*
In Constant 1972 Dollars (Billions)						
1961	$14.2	$13.8	$ 5.4	$ 7.2	$1.1	$1.4
1962	16.1	14.4	7.3	7.8	1.1	1.4
1963	18.2	17.1	8.5	9.2	1.2	1.4
1964	24.3	21.8	11.6	11.3	1.8	1.6
1965	29.6	27.1	15.2	14.3	2.7	1.8
1966	32.8	30.0	17.7	16.8	3.5	2.1
1967	30.0	29.6	14.8	16.3	3.1	1.9
1968	29.6	30.8	14.9	16.9	2.8	1.8
1969	33.6	33.7	17.0	17.9	3.4	1.8
1970	27.5	31.0	13.5	16.2	3.4	1.8
1971	23.9	28.9	11.5	14.8	2.8	1.9
1972	28.8	33.3	14.1	17.2	3.2	2.3
1973	41.6	46.7	21.0	23.9	4.1	3.1
1974	47.4	58.0	22.2	27.5	5.1	4.2
1975	34.6	55.3	12.6	23.9	2.9	3.9
1976	36.5	56.1	16.4	26.1	3.7	4.3
1977	43.7	62.3	18.5	28.6	3.6	4.4
1978	43.2	66.8	21.3	32.8	4.1	4.9
1979(r)	52.5	74.6*	26.0	37.5*	6.2	6.1*
1980(r)	58.5	82.6*	24.9	38.6*	5.3	5.9*
1981(r)	55.0	83.5*	22.4	38.0*	6.7	7.0*
1982(r)	43.7	72.7*	16.3	31.6*	4.4	5.4*
1983(p)	44.6	74.1*	19.2	33.0*	4.0	5.4*

p - Preliminary estimate. r - Revised. * - Seasonally adjusted.

(a) These data are the results of The Conference Board's survey of the 1,000 largest U.S. manufacturers and pertain only to their domestic capital investment. This series is copyrighted by The Conference Board and can be reproduced only with their written permission.

Source: The Conference Board.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Selected Industry Groups, 1979 to Date

(Millions of Dollars)

	1979		1980		1981	
Industry Group	Total	Machinery & Equipment	Total	Machinery & Equipment	Total	Machinery & Equipment
All Operating Manufacturing Establishments	$522,560	$393,645	$573,570	$433,995	$630,438	$479,233
Fabricated Metal Products	30,811	22,943	33,721	25,369	36,363	27,416
Nonelectrical Machinery	46,263	33,471	52,662	38,324	59,740	43,580
Construction & Related Machinery	8,720	5,911	9,864	6,747	11,226	7,754
Metalworking Machinery	5,865	4,451	6,546	4,996	7,269	5,552
Metal Cutting Machine Tools	1,333	961	1,453	1,036	1,627	1,164
Metal Forming Machine Tools	566	406	612	444	636	456
Other Metalworking Machinery	3,966	3,084	4,481	3,516	5,007	3,932
Special Industrial Machinery	3,130	2,146	3,458	2,395	3,793	2,638
General Industrial Machinery	6,544	4,828	7,378	5,490	8,191	6,106
Office & Computing Machines	6,750	4,742	8,319	5,895	10,008	7,023
Other Nonelectrical Machinery	15,254	11,393	17,097	12,801	9,914	7,569
Electrical Machinery	30,340	21,626	35,278	25,340	40,430	29,051
Transportation Equipment	40,328	28,762	45,636	32,814	53,361	39,437
Instruments & Related Products	10,377	6,897	11,825	7,941	13,360	9,051

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, 1977 "Census of Manufactures," "Annual Survey of Manufactures."

The tables appearing on this and the following page are included to provide some measure of the total stock of fixed assets in selected machine tool consuming industries. However, neither table presents an ideal measurement. Data in the "Gross Book Value" table include the total original cost of assets until the time they are fully depreciated. These are available only on an annual basis. The "Net Value" table is more current and is available on a quarterly basis but includes land, mineral rights, depletion, and amortization.

The data in the tables are not directly comparable due to these definitional differences in sample coverage and statistical methodology. For additional information on the gross book value of depreciable assets in the machine tool industry, see chapter 8.

NET VALUE OF PROPERTY, PLANT AND EQUIPMENT (a)

Selected Industry Groups, 1974 to Date

(Millions of Dollar)

Year: Qtr.	All Manufacturing	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Transportation Equipment	Instruments and Related Products
1974:1	$237,598	$ 9,688	$16,556	$15,520	$19,074	$ 5,024
:2	245,053	10,048	17,198	15,798	19,582	5,319
:3	252,095	9,914	17,915	16,118	20,283	5,503
:4	262,142	10,428	21,457	14,620	20,617	6,095
1975:1	266,114	10,487	21,884	14,854	21,529	6,480
:2	273,796	10,865	22,541	15,035	22,382	6,645
:3	278,565	10,751	22,854	15,157	22,557	6,659
:4	283,669	10,816	23,018	14,977	22,515	6,919
1976:1	287,362	11,160	23,342	15,001	21,669	6,938
:2	293,435	11,149	23,786	15,155	21,673	6,990
:3	300,895	11,363	23,967	15,246	21,924	7,138
:4	307,360	11,469	24,745	15,452	21,927	7,210
1977:1	310,962	11,443	25,206	15,780	21,808	7,240
:2	318,941	11,797	25,940	15,735	22,513	7,417
:3	327,798	12,144	26,635	16,366	23,317	7,406
:4	339,809	12,286	27,805	17,051	24,369	7,555
1978:1	348,397	12,301	28,893	17,063	24,874	7,828
:2	357,773	12,720	29,803	17,551	26,074	7,820
:3	367,736	13,450	30,849	18,179	27,331	7,896
:4	382,953	14,208	32,168	19,175	28,883	8,162
1979:1	393,630	14,681	33,204	19,480	29,982	8,343
:2	405,188	15,213	34,931	20,048	31,289	8,631
:3	418,836	15,556	36,345	20,925	32,857	8,925
:4	441,415	15,597	39,093	22,222	34,130	9,447
1980:1	455,115	15,871	41,330	22,360	35,514	9,549
:2	468,348	16,309	42,619	23,204	36,913	9,826
:3	487,080	16,569	44,381	24,323	38,312	10,253
:4	515,022	18,607	46,718	26,186	39,861	10,761
1981:1	529,406	18,886	47,618	27,048	41,440	11,101
:2	547,707	19,391	49,446	28,072	42,533	11,491
:3	565,901	19,493	51,334	29,106	43,911	11,837
:4	586,077	19,846	54,078	30,817	44,746	12,425
1982:1	604,415	20,269	55,103	30,912	45,858	12,771
:2	618,376	20,952	56,950	31,808	46,481	13,047
:3	631,131	21,172	58,678	32,913	47,362	13,579
:4(r)	643,348	21,686	59,010	33,407	48,240	13,939
1983:1	648,112	22,380	58,624	33,792	48,033	14,111
:2	653,660	21,964	58,452	33,735	47,702	14,372
:3	658,354	22,172	58,386	34,787	47,700	14,231
:4(p)	662,119	21,756	58,357	36,274	48,392	14,535

p - Preliminary. r - Revised.

(a) Depreciable fixed assets including construction in progress, land and mineral rights less accumulated depreciation, depletion and amortization.

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

Net Value of Property, Plant and Equipment data are collected quarterly by extensive survey of manufacturing, mining and trade corporations. Each corporation is required to show gross receipts by source industry and is classified in the particular industry which accounts for the largest share of gross receipts. Please note that these procedures may lead to a conglomerate corporation being assigned to an industry from which only a small proportion of its receipts are obtained. For this reason, the above data should be used with caution.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Short-term Rates, 1968 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1968	6.68%	6.36%	6.84%	6.89%	6.61%
1969	8.21	7.32	7.86	8.82	8.83
1970	8.48	8.86	8.49	8.50	8.07
1971(a)	6.48	6.59	6.01	6.51	6.18
1972	5.82	5.52	5.59	5.84	6.33
1973	8.30	6.52	7.35	9.24	10.08
1974	11.28	9.91	11.15	12.40	11.64
1975	8.65	9.94	8.16	8.22	8.29
1976	7.52	7.54	7.44	7.80	7.28
1977	7.85	7.48	7.37	7.87	8.66
1978	9.84	8.95	9.01	9.97	11.44
1979	13.18	12.27	12.34	12.31	15.81
1980	15.17	15.67	17.75	11.56	15.7
1981	19.56	19.91	19.99	21.11	17.23
1982	14.69	17.13	17.11	13.27	11.26
1983	10.64	10.20	10.31	11.09	10.95

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .16% decrease from 6.75% to 6.59%.

Source: Federal Reserve Board.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Long-term Rates, 1968 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1968	6.73%	6.35%	6.73%	7.03%	6.79%
1969	8.01	6.64	7.87	8.66	8.86
1970	8.47	8.67	8.25	8.66	8.31
1971(a)	6.57	6.82	6.36	6.67	6.44
1972	6.12	5.64	5.87	6.31	6.67
1973	8.63	7.12	7.67	9.85	10.68
1974	11.70	10.16	11.41	13.08	12.16
1975	9.06	10.26	8.22	8.89	8.88
1976	7.99	8.02	8.02	8.45	7.48
1977	8.52	9.05	8.24	8.09	8.71
1978	10.11	9.19	9.67	10.20	11.38
1979	12.98	12.01	12.08	12.25	15.56
1980	15.32	15.79	18.37	12.06	15.07
1981	19.52	19.26	19.25	20.62	18.94
1982	15.25	16.59	16.96	15.22	12.24
1983	12.01	11.81	11.46	11.83	12.94

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .08% decrease from 6.90% to 6.82%.

Source: Federal Reserve Board.

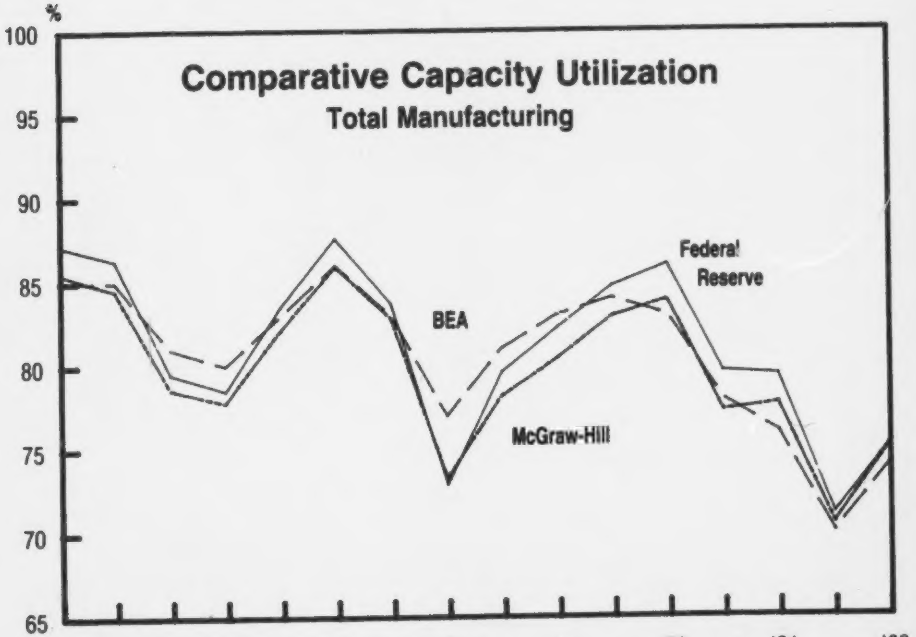
COMPARATIVE CAPACITY UTILIZATION MEASURES
Total Manufacturing, 1968 to Date

Year	Federal Reserve Board (r)	Bureau of Economic Analysis	McGraw-Hill
1968	87.2%	85%	85.5%
1969	86.3	85	84.5
1970	79.5	81	78.6
1971	78.5	80	77.8
1972	83.5	83	82.1
1973	87.6	86	85.9
1974	83.7	83	82.8
1975	72.9	77	73.3
1976	79.6	81	78.2
1977	82.2	83	80.4
1978	84.7	84	82.9
1979	86.0	83	83.9
1980	79.6	78	77.3
1981	79.4	76	77.7
1982(r)	71.1	70	70.5
1983	75.2	74	75.1

r - Revised.

Sources: Federal Reserve Board; U.S. Department of Commerce, Bureau of Economic Analysis; McGraw-Hill Publications Company.

For further explanation of "Capacity Utilization" see chapter introduction.



CAPACITY UTILIZATION IN MANUFACTURING
Bureau of Economic Analysis, Operating Rates
1966 to Date

	Total Mfg.	Total Durables	Electrical Machinery	Machinery, Except Electrical	Motor Vehicles	Aircraft	Advanced-Processed Goods (a)
1966	86%	87%	84%	95%	90%	82%	85%
1967	84	83	78	91	87	82	83
1968	85	84	80	90	93	82	84
1969	85	84	80	92	90	77	84
1970	81	78	76	86	81	68	79
1971	80	78	76	81	92	65	80
1972	83	82	81	84	97	69	82
1973	86	85	82	87	100	69	84
1974	83	82	83	88	83	71	82
1975	77	76	73	83	83	65	77
1976	81	81	80	86	93	65	81
1977	83	84	82	89	99	68	83
1978	84	84	83	91	95	70	84
1979	83	83	82	91	84	76	82
1980	78	77	80	90	67	79	78
1981	76	75	76	89	63	75	76
1982	70	67	72	81	61	69	72
1983	74	71	75	79	76	66	75
1979 1st Qtr. (b)	84	85	84	92	96	74	84
2nd Qtr. (b)	83	84	82	92	89	75	83
3rd Qtr. (b)	82	82	82	91	78	77	81
4th Qtr. (b)	81	80	81	89	72	77	80
1980 1st Qtr. (b)	80	80	82	91	70	79	80
2nd Qtr. (b)	76	74	78	89	60	78	76
3rd Qtr. (b)	76	75	79	89	67	78	77
4th Qtr. (b)	78	78	79	90	70	80	78
1981 1st Qtr. (b)	78	77	78	89	69	77	78
2nd Qtr. (b)	78	77	76	90	73	75	78
3rd Qtr. (b)	76	74	76	89	60	75	76
4th Qtr. (b)	72	70	74	88	51	73	73
1982 1st Qtr. (b)	72	70	73	85	61	71	73
2nd Qtr. (b)	71	68	72	82	67	70	74
3rd Qtr. (b)	69	65	71	79	58	69	71
4th Qtr. (b)	68	63	71	76	56	67	69
1983 1st Qtr. (b)	70	66	71	75	63	66	71
2nd Qtr. (b)	73	70	75	79	75	65	74
3rd Qtr. (b)	76	73	77	80	80	65	76
4th Qtr. (b)	77	75	78	83	85	67	78

(a) Advanced-Processed Goods include producers of furniture, electrical machinery, machinery except electrical, motor vehicles, aircraft, other transportation equipment, instruments, miscellaneous manufactures, food including beverage, tobacco, apparel, printing and publishing, chemicals (at 1/2 weight), and leather.

(b) Seasonally Adjusted.

Source: U.S. Department of Commerce, "Survey of Current Business," July 1974 and issues for March, June, September and December of later years.

CAPACITY UTILIZATION IN MANUFACTURING
McGraw-Hill, Operating Rates, Seasonally Adjusted
1966 to Date

Year	Total Mfg.	Total Durables	Metal-Working Industries	Fabricated Metals	Electrical Machinery	Machinery, except Electrical	Motor Vehicles and Parts
1966	89.1%	90.1%	91.6%	89.6%	92.0%	92.4%	92.8%
1967	85.4	84.9	86.6	86.6	86.3	87.3	79.3
1968	85.5	84.7	85.9	84.7	83.3	85.4	93.0
1969	84.5	84.0	84.3	81.4	78.0	87.9	94.3
1970	78.6	75.1	73.3	72.5	67.3	79.6	74.0
1971	77.8	73.5	71.5	69.8	65.2	72.2	93.0
1972	82.1	78.7	76.8	72.6	70.9	77.5	103.5
1973	85.9	84.7	83.2	78.6	79.8	84.1	104.8
1974	82.8	80.9	79.6	78.5	78.6	84.1	76.7
1975	73.3	69.4	69.2	71.7	64.6	72.3	64.6
1976	78.2	75.0	74.2	77.8	73.2	75.0	76.1
1977	80.4	78.2	78.1	78.5	78.1	77.0	87.0
1978	82.9	81.5	81.4	81.8	82.0	81.1	85.5
1979	83.9	83.0	83.6	84.8	84.1	85.6	78.5
1980	77.3	74.6	76.1	75.3	76.6	81.3	59.3
1981	77.7	75.3	75.6	77.8	79.7	80.6	62.7
1982(r)	70.5	66.0	67.7	65.1	74.0	68.0	59.1
1983(p)	75.1	70.5	70.5	67.8	76.7	68.3	72.9
1979 1st Qtr.	84.7	84.3	84.7	86.0	84.8	85.3	85.5
2nd Qtr.	84.0	83.5	84.0	85.5	84.0	85.7	81.8
3rd Qtr.	84.2	83.0	83.0	84.2	83.3	86.5	74.8
4th Qtr.	82.8	81.3	82.7	83.5	84.5	85.0	71.8
1980 1st Qtr.	82.3	80.8	81.5	81.9	82.9	86.2	65.3
2nd Qtr.	76.3	73.5	75.5	74.7	77.0	81.4	54.6
3rd Qtr.	73.7	70.0	72.5	70.1	72.8	78.4	54.2
4th Qtr.	76.9	74.2	74.9	74.3	73.7	79.2	63.0
1981 1st Qtr.	78.6	76.2	75.8	79.7	79.0	81.4	60.9
2nd Qtr.	78.8	76.8	77.2	79.7	80.3	81.7	68.6
3rd Qtr.	78.8	76.5	76.7	78.8	81.0	82.0	64.7
4th Qtr.	74.6	71.5	72.6	73.0	78.4	77.1	56.7
1982 1st Qtr.(r)	71.9	68.1	69.2	68.0	76.1	72.5	52.7
2nd Qtr.(r)	70.9	67.0	69.0	65.9	75.4	68.8	63.4
3rd Qtr.(r)	70.5	66.0	67.8	64.8	73.5	66.8	64.0
4th Qtr.(r)	68.6	63.0	64.9	61.5	71.2	63.9	56.1
1983 1st Qtr.(r)	70.7	65.6	66.0	63.2	72.4	62.8	64.2
2nd Qtr.	73.7	68.9	68.7	65.9	75.0	66.5	69.5
3rd Qtr.	77.3	72.7	72.6	70.4	78.3	70.9	77.1
4th Qtr.	78.6	74.8	74.6	71.4	80.6	73.0	81.1
1984 1st Qtr.	80.4	77.7	77.7	73.5	83.0	77.0	86.8

r - Revised.

Source: McGraw-Hill Publications Company.

INDUSTRIAL PRODUCTION INDEXES

Major and Selected Industry Groupings, 1963 to Date

1967 = 100 (Quantity of Output Basis)

Year	Total Industrial Production	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nonelectrical Machinery
1963	76.5	75.8	73.1	82.3	77.8	66.3
1964	81.7	81.0	78.3	92.8	82.6	75.6
1965	89.8	89.7	89.0	102.1	90.8	85.0
1966	97.8	97.9	98.9	108.4	97.2	98.8
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	106.3	106.4	106.5	104.3	106.6	101.8
1969	111.1	111.0	110.6	113.8	107.9	109.3
1970	107.8	106.4	102.3	106.6	102.4	104.4
1971	109.6	108.2	102.4	100.2	103.5	100.2
1972	119.7	118.9	113.7	112.1	112.1	116.0
1973	129.8	129.8	127.1	126.7	124.7	133.7
1974	129.3	129.4	125.7	123.1	124.2	140.1
1975	117.8	116.3	109.3	96.4	109.9	125.1
1976	129.8	129.5	121.7	108.9	123.3	135.0
1977	137.1	137.1	129.5	110.2	130.9	144.8
1978	146.1	146.7	139.7	119.9	141.6	153.6
1979	152.5	153.6	146.4	121.3	148.5	163.7
1980	147.0	146.7	136.7	102.3	134.1	162.8
1981	151.0	150.4	140.5	107.9	136.4	171.2
1982(r)	138.6	137.6	124.7	75.3	114.8	149.0
1983	147.6	148.2	134.5	85.4	120.2	150.6

r - Revised.

Source: Federal Reserve Board.

INDUSTRIAL PRODUCTION INDEXES

(Continued)

Year	Electrical Machinery	Transportation Equipment	Motor Vehicles and Parts	Aircraft and Parts	Instruments
1963	64.7	78.0	88.3	68.8	66.3
1964	68.4	80.0	90.7	67.7	71.8
1965	81.7	95.1	115.9	71.9	82.6
1966	97.9	102.0	113.9	88.4	90.5
1967	100.0	100.0	100.0	100.0	100.0
1968	105.5	111.1	120.3	103.0	106.2
1969	111.9	108.4	116.5	97.3	115.0
1970	108.1	89.5	92.3	81.1	112.0
1971	107.7	97.9	118.6	67.7	109.5
1972	122.2	108.2	135.8	67.0	120.4
1973	143.1	118.3	148.8	75.1	137.7
1974	143.8	108.7	128.2	78.3	144.1
1975	116.5	97.4	111.1	73.3	132.3
1976	131.5	110.6	140.7	69.3	148.2
1977	141.9	121.1	159.7	69.6	159.1
1978	159.4	132.5	169.9	84.2	167.1
1979	175.0	135.4	159.9	100.0	174.9
1980	172.8	116.9	119.0	106.1	171.1
1981	178.4	116.[illegible]	122.3	105.0	170.3
1982(r)	169.3	104.9	109.8	100.4	161.9
1983	185.5	117.8	137.1	99.6	158.7

r - Revised.

Source: Federal Reserve Board.

PRODUCTIVITY IN MANUFACTURING (r)

Indexes, 1947 to Date

1977 = 100

	Productivity (a) (Output Per Hour of All Persons)	Constant Dollar Output	Hours (All Persons)	Compensation Per Hour		Unit Labor Costs
				Current	Real (b)	
1947	42.4	33.9	79.9	17.5	47.6	41.4
1948	45.1	35.9	79.4	19.5	49.2	43.3
1949	46.9	33.9	72.4	20.4	51.9	43.6
1950	49.4	38.6	78.2	21.5	54.0	43.4
1951	51.1	43.0	84.2	23.6	55.1	46.2
1952	52.0	44.5	85.4	25.2	57.4	48.3
1953	52.9	47.5	89.8	26.5	60.1	50.1
1954	53.7	44.1	82.1	27.7	62.5	51.6
1955	56.4	48.9	86.6	28.8	65.1	51.0
1956	56.0	49.2	87.9	30.6	68.3	54.7
1957	57.1	49.5	86.5	32.5	69.9	56.8
1958	56.9	45.2	79.4	33.9	71.1	59.6
1959	59.6	50.5	84.7	35.2	73.2	59.1
1960	60.0	50.7	84.4	36.7	75.1	61.1
1961	61.6	50.7	82.3	37.7	76.4	61.2
1962	64.3	55.1	85.6	39.1	78.4	60.9
1963	68.9	59.6	86.5	40.3	79.8	58.5
1964	72.3	63.9	88.4	42.0	82.0	58.1
1965	74.5	69.8	93.6	42.8	82.3	57.5
1966	75.3	75.1	99.8	44.8	83.5	59.4
1967	75.3	75.0	99.6	47.0	85.3	62.4
1968	78.0	79.1	101.4	50.4	87.7	64.6
1969	79.3	81.7	103.1	53.9	89.1	68.0
1970	79.1	77.0	97.3	57.6	89.8	72.7
1971	83.9	78.7	93.7	61.1	91.4	72.7
1972	88.2	86.2	97.8	64.4	93.2	73.0
1973	93.0	95.9	103.2	69.0	94.1	74.2
1974	90.8	91.9	101.2	76.3	93.8	84.1
1975	93.4	85.4	91.4	85.4	96.2	91.5
1976	97.5	93.6	95.9	92.3	98.3	94.6
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.9	105.3	104.5	108.3	100.6	107.4
1979	101.5	108.2	106.6	118.8	99.2	117.0
1980	101.7	103.5	101.8	132.7	97.6	130.5
1981	105.3	106.5	101.2	145.8	97.2	138.5
1982	106.5	99.1	93.0	158.2	99.3	148.5
1983	113.1	106.8	94.4	166.7	101.4	147.4
1983						
1st Quarter	109.5	99.7	91.1	165.1	102.1	150.8
2nd Quarter	111.7	104.5	93.5	166.0	101.5	148.5
3rd Quarter	114.9	110.0	95.7	167.1	101.2	145.4
4th Quarter	116.0	112.7	97.2	168.7	101.1	145.5
1984						
1st Quarter	116.8	116.3	99.5	171.3	101.4	146.7

r - Revised.

(a) The productivity index is obtained by dividing the constant dollar output index by the labor input (hours) index.

(b) Compensation per hour adjusted for changes in the Consumer Price Index.

Source: U.S. Bureau of Labor Statistics.

This table is based on output and compensation data published by the Commerce Department's Bureau of Economic Analysis. The indexes for manufacturing output, which are based on figures taken from Gross National Product components, vary from those for manufacturing production in the tables of industrial production indexes. The latter are generated independently by the Federal Reserve Board from their own survey and using their own methodology.

SELECTED LEADING BUSINESS CYCLE INDICATORS
1950 to Date

	Composite 12 Leading Indicators	Selected Leading Indicators					
		Average Workweek, Mfg.	Layoff Rate, Mfg.	New Orders Consumer Goods (r)	Orders for Plant & Equipment	Net Change in Inventories (r)	Change in Sensitive Prices
	1967 = 100	Hours	Per 100 Employees	$72 Billion	$72 Billion	$72 Billion Annual Rate	Percent
1950	56.3	40.5	1.3	179.34	52.79	11.4	2.5
1951	56.0	40.6	1.4	193.78	62.15	23.6	−0.5
1952	57.1	40.7	1.4	190.70	53.24	8.7	−0.8
1953	67.9	40.5	1.6	196.17	51.05	−0.2	−0.5
1954	58.6	39.6	2.3	183.12	42.62	−12.3	0.3
1955	66.6	40.7	1.5	234.96	58.15	6.7	0.5
1956	66.5	540.4	1.7	216.25	60.63	8.2	−0.1
1957	64.5	39.8	2.1	205.54	52.31	−4.8	−0.6
1958	65.7	39.2	2.6	194.74	47.04	−5.6	0.3
1959	73.1	40.3	2.0	227.48	55.32	12.4	0.3
1960	71.3	39.7	2.4	214.81	54.60	−3.6	−0.5
1961	75.2	39.8	2.2	225.44	55.49	1.8	0.1
1962	79.6	40.4	2.0	241.15	60.54	6.5	−0.2
1963	84.5	40.5	1.8	259.00	65.95	7.4	0.1
1964	90.6	40.7	1.7	280.39	74.89	11.6	0.5
1965	96.0	41.2	1.4	308.24	81.99	13.3	0.1
1966	99.0	41.4	1.2	327.93	94.63	20.9	−0.3
1967	100.0	40.6	1.4	323.14	87.23	9.4	−0.1
1968	107.2	40.7	1.2	346.36	115.03	9.8	0.5
1969	111.1	40.6	1.2	358.23	123.31	12.3	0.6
1970	105.5	39.8	1.8	327.13	105.32	0.2	−0.4
1971	113.5	39.9	1.6	343.15	109.87	4.0	0.4
1972	125.0	40.5	1.1	387.93	121.93	13.3	1.0
1973	132.2	40.7	0.9	432.04	148.99	25.2	2.3
1974	121.2	40.0	1.5	396.18	149.01	10.4	−0.1
1975	115.7	39.5	2.1	342.08	116.89	−17.3	−0.3
1976	130.9	40.1	1.3	391.14	132.21	7.9	1.1
1977	139.4	40.3	1.1	433.17	146.40	13.3	0.4
1978	145.8	40.4	0.9	458.31	172.55	20.4	1.3
1979	145.1	40.2	1.1	450.20	186.09	9.1	0.9
1980(r)	138.2	39.7	1.7	399.98	171.94	−7.8	0.1
1981	140.9	39.8	1.5	398.51	168.81	1.3	−0.6
1982(r)	136.8	38.9	NA	353.23	148.84	−14.4	−0.7
1983(p)	156.2	40.1	NA	409.54	162.69	2.9	1.1
1983 1st Qtr.(p)	147.6	39.5	NA	94.76	36.18	−16.8	0.8
2nd Qtr.(p)	154.7	40.1	NA	99.44	41.91	−2.9	1.4
3rd Qtr.(p)	159.2	40.4	NA	105.11	41.62	10.7	1.0
4th Qtr.(p)	163.2	40.6	NA	110.23	42.98	20.4	0.9
1984 1st Qtr.(p)	166.0	40.8	NA	114.15	45.95	21.6	0.5

NA - Not Available. p - Preliminary. r - Revised.

Note: New orders, plant and equipment orders, and change in inventory data are based in 1972 dollars.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, "Business Conditions Digest" (monthly).

Twelve economic indicators normally precede changes in the business year. These are the "leading indicators", six of which are shown separately in the table together with the composite of the 12.

BUSINESS CYCLE REFERENCE DATES
1854 to Date

Trough	Peak	Expansion Duration (in Months) (a)
Dec. 1854	June 1857	30
Dec. 1858	Oct. 1860	22
June 1861	Apr. 1865	46(b)
Dec. 1867	June 1869	18
Dec. 1870	Oct. 1873	34
Mar. 1879	Mar. 1882	36
May 1885	Mar. 1887	22
Apr. 1888	July 1890	27
May 1891	Jan. 1893	20
June 1894	Dec. 1895	18
June 1897	June 1899	24
Dec. 1900	Sept. 1902	21
Aug. 1904	May 1907	33
June 1908	Jan. 1910	19
Jan. 1912	Jan. 1913	12
Dec. 1914	Aug. 1918	44(b)
Mar. 1919	Jan. 1920	10
July 1921	May 1923	22
July 1924	Oct. 1926	27
Nov. 1927	Aug. 1929	21
Mar. 1933	May 1937	50
June 1938	Feb. 1945	80(b)
Oct. 1945	Nov. 1948	37
Oct. 1949	July 1953	45(b)
May 1954	Aug. 1957	39
Apr. 1958	Apr. 1960	24
Feb. 1961	Dec. 1969	106(b)
Nov. 1970	Nov. 1973	36
Mar. 1975	Jan. 1980	58
July 1980	July 1981	12
Nov. 1982		
Average Peacetime Cycles:		
25 cycles, 1854-1981		27
11 cycles, 1919-1981		31
6 cycles, 1945-1981		34

(a) Time period from trough to peak.
(b) Wartime expansions (Civil War, World War I and II, Korean War and Vietnam War.)

Source: National Bureau of Economic Research, Inc.

The historical business cycle turning dates, above, are those designated by the National Bureau of Economic Research, Inc. (NBER). They mark the approximate dates when, according to the NBER, aggregate economic activity reached its cyclical high (peak) or low (trough) levels.

MANUFACTURERS' INVENTORIES

Major Industry Groups, 1968 to Date

(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Total Manufacturing	Durables	By Industry Group		By Capital Goods Industries	
			Primary Metals	Fabricated Metal Products	Nondefense	Defense
1968	$ 90.6	$ 58.9	$ 7.5	$ 7.4	$19.8	$ 7.2
1969	98.2	64.7	8.1	7.6	22.6	7.6
1970	101.7	66.8	9.0	7.8	24.6	4.9
1971	102.7	66.3	9.1	8.0	24.2	4.0
1972	108.2	70.3	9.6	8.5	25.3	4.3
1973	124.6	81.4	10.0	9.9	29.8	4.5
1974	157.8	101.7	13.4	13.4	37.5	4.9
1975	159.9	102.9	15.7	13.1	37.1	5.7
1976	175.2	112.6	17.6	14.4	37.7	6.5
1977	189.2	121.6	18.2	15.6	41.6	6.1
1978(r)	210.4	137.8	19.4	17.3	49.4	6.4
1979(r)	240.9	160.5	22.4	19.2	60.0	8.4
1980(r)	264.1	174.6	22.9	19.6	68.5	10.7
1981(r)	282.1	186.1	25.6	20.3	72.9	13.4
1982(r)	264.6	175.0	21.4	17.7	70.3	15.9
1983	260.4	171.6	19.2	17.8	65.4	17.8

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1977-1983" and Series M3-1 (monthly).

MANUFACTURERS' INVENTORIES

Selected Industry Groups, 1968 to Date

(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products
1968	$11.6	$ 8.8	$ 3.9	$10.5	$2.5
1969	13.3	9.6	4.1	11.8	2.7
1970	14.4	9.8	4.2	10.4	2.9
1971	14.2	9.4	4.2	9.6	3.0
1972	15.1	9.9	4.7	10.1	3.2
1973	18.4	12.1	5.8	10.7	3.8
1974	24.1	14.0	6.7	12.5	4.9
1975	24.1	13.0	6.1	13.5	4.8
1976	25.3	14.5	8.0	13.1	5.4
1977	27.3	16.4	9.2	13.3	6.0
1978(r)	31.7	19.0	10.2	15.8	6.9
1979(r)	37.1	23.0	10.9	20.7	7.9
1980(r)	40.7	25.9	9.8	26.1	9.1
1981(r)	43.4	28.4	9.1	28.4	9.7
1982(r)	40.1	26.6	8.3	32.1	9.2
1983	36.7	28.2	9.5	31.1	9.0

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1977-1983" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS

Major Industry Groups, 1968 to Date

(Billions of Dollars)

Year	Total Manufacturing	Durables	By Industry Group		By Capital Goods Industries	
			Primary Metals	Fabricated Metal Products	Nondefense	Defense
1968	$ 608.2	$ 337.4	$ 48.1	$ 45.1	$ 84.8	$26.8
1969	647.6	358.6	54.9	47.7	92.9	24.5
1970	624.8	329.0	51.8	44.4	81.6	21.5
1971	671.9	360.1	51.3	44.4	90.2	19.0
1972	770.0	420.8	61.4	52.9	103.5	20.8
1973	915.1	515.2	80.8	64.8	131.7	23.7
1974	1,047.2	562.2	99.0	74.4	152.1	25.7
1975	1,021.8	504.2	74.1	64.4	132.1	24.8
1976	1,194.5	616.8	94.5	76.2	153.6	31.1
1977(r)	1,380.4	733.0	105.5	91.5	183.5	35.2
1978(r)	1,578.6	868.1	124.6	104.6	233.5	41.8
1979(r)	1,768.8	953.4	139.6	116.6	278.8	34.1
1980(r)	1,873.9	952.3	134.1	115.3	279.1	58.7
1981(r)	2,013.1	1,002.7	137.0	122.4	288.6	59.1
1982(r)	1,888.7	901.6	101.0	106.8	248.2	75.4
1983	2,061.2	1,053.7	123.4	119.5	273.2	81.6

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1977-1983" and Series M3-1 (monthly).

MANUFACTURERS' UNFILLED ORDERS

Major Industry Groups, 1968 to Date

(Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Total Manufacturing	Durables	By Industry Group		By Capital Goods Industries	
			Primary Metals	Fabricated Metal Products	Nondefense	Defense
1968	$109.9	$105.9	$ 6.5	$13.9	$ 49.5	$ 24.7
1969	115.1	111.0	7.9	15.0	53.9	22.4
1970	105.9	101.3	7.7	14.9	47.8	20.2
1971	106.8	101.7	7.4	13.5	49.4	19.6
1972	121.1	114.7	10.3	15.1	54.6	19.7
1973	161.3	153.9	18.5	21.1	70.5	22.0
1974	191.1	185.6	21.9	28.2	86.8	26.3
1975	173.8	165.9	15.1	24.1	79.4	28.1
1976	182.5	174.2	16.8	23.0	81.7	32.0
1977(r)	203.5	195.0	17.2	24.5	90.9	37.2
1978(r)	259.8	249.5	23.8	27.9	117.0	47.7
1979(r)	302.0	290.8	26.0	30.9	149.0	49.0
1980(r)	323.3	312.6	26.3	30.1	155.9	67.2
1981(r)	318.8	308.8	21.3	28.9	146.5	78.1
1982(r)	296.1	287.0	15.1	21.6	123.1	96.7
1983	330.1	319.3	20.8	20.5	123.9	112.8

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1977-1983" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS
Selected Industry Groups, 1968 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1968	$ 51.9	$ 46.3	$28.2	$ 57.7	$ 1.5
1969	59.4	48.0	24.7	59.2	1.7
1970	54.9	47.0	17.4	50.0	.9
1971	56.1	48.5	22.5	67.4	.9
1972	70.9	54.1	21.0	75.5	1.4
1973	89.2	64.7	26.7	91.5	2.6
1974	105.3	67.8	29.9	84.1	2.6
1975	92.7	62.8	26.9	82.2	1.3
1976	107.4	77.0	31.9	111.7	2.2
1977	126.7	92.5	40.8	134.1	3.0
1978	154.5	106.8	54.9	158.2	4.3
1979	174.6	121.6	68.3	154.2	5.6
1980	180.6	135.6	73.1	129.0	4.8
1981	200.5	144.7	64.1	139.6	2.9
1982(r)	162.9	147.6	67.7	132.9	1.5
1983	180.9	165.6	81.9	172.1	1.7

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1977-1983" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' UNFILLED ORDERS
Selected Industry Groups, 1968 to Date
(Billions of Dollars, Seasonally Adjusted)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1968	$20.4	$16.4	$ 35.5	$ 7.8	$ 1.1
1969	23.7	16.8	33.4	8.7	1.2
1970	22.1	16.6	26.3	8.6	.7
1971	22.2	17.2	26.4	9.6	.6
1972	27.5	18.0	26.2	11.5	1.0
1973	38.9	22.0	27.8	17.4	2.1
1974	51.9	24.0	30.4	20.6	2.6
1975	48.9	22.7	28.1	18.4	1.5
1976	50.8	25.9	28.9	19.6	1.6
1977	55.4	30.1	37.3	19.1	2.3
1978(r)	66.8	36.6	54.7	25.9	3.6
1979(r)	75.0	42.3	74.9	26.9	5.4
1980(r)	74.9	49.4	89.6	27.8	5.5
1981(r)	73.6	53.9	88.9	26.9	3.3
1982(r)	55.8	60.3	93.0	28.2	1.2
1983	58.4	70.0	103.9	30.6	1.0

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1977-1983" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1968 to Date
(Billions of Dollars)

Year	Total Manufacturing	Durables	By Industry Group		By Capital Goods Industries	
			Primary Metals	Fabricated Metal Products	Nondefense	Defense
1968	$ 603.2	$ 332.4	$ 48.7	$ 44.1	$ 81.4	$26.7
1969	642.5	353.7	53.5	46.6	88.5	26.5
1970	634.0	338.6	52.0	44.5	87.5	23.8
1971	671.1	359.7	51.6	45.7	88.5	19.7
1972	756.3	408.3	58.4	51.5	97.9	20.2
1973	875.2	476.2	72.7	58.9	115.8	21.4
1974	1,017.5	530.7	95.6	67.3	135.9	21.3
1975	1,039.1	523.9	80.8	68.5	139.6	23.0
1976	1,185.6	608.3	93.0	77.4	151.4	26.7
1977	1,358.4	711.2	103.2	90.0	174.5	30.1
1978	1,522.9	814.2	118.1	101.3	207.6	31.2
1979	1,727.2	912.7	137.4	113.6	247.1	32.9
1980	1,852.7	930.6	133.9	116.2	272.4	40.6
1981(r)	2,017.5	1,006.5	141.9	123.7	297.7	48.2
1982(r)	1,910.3	922.3	107.0	114.0	271.3	56.7
1983	2,047.4	1,021.5	117.9	120.6	272.3	65.2

r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1977-1983" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Shipments, and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1968 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products	Machine Tools
1968	$ 51.0	$ 45.2	$ 49.5	$34.1	$12.3	$1.7
1969	56.1	47.6	50.9	34.2	13.1	1.6
1970	56.5	47.2	42.5	32.0	13.1	1.4
1971	56.0	48.0	58.2	30.6	13.5	1.0
1972	65.8	53.4	63.9	30.8	15.5	1.0
1973	77.8	60.9	74.8	35.8	17.9	1.5
1974	92.5	65.8	68.6	39.6	21.0	2.0
1975	95.8	64.2	70.0	43.5	22.1	2.5
1976	105.5	73.9	95.4	45.6	25.0	2.1
1977	122.2	88.4	117.7	49.2	28.9	2.3
1978	143.2	100.5	132.0	56.8	33.7	3.0
1979	166.5	116.0	131.4	70.2	37.7	3.9
1980	180.7	128.6	104.6	82.0	44.1	4.7
1981	201.5	140.2	117.0	88.2	48.3	5.1
1982(r)	180.6	141.1	112.2	82.9	48.9	3.6
1983	178.3	156.0	151.9	88.6	50.0	1.8

r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1977-1983" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

SHIPMENTS: METALWORKING MACHINERY AND MACHINE TOOLS
Monthly, 1978 to Date
(Millions of Dollars, Not Seasonally Adjusted)

Month	1978	1979	1980	1981	1982	1983
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$ 584	$ 654	$ 822	$ 885	$ 916	$ 638
Feb.	666	811	994	1,091	953	645
Mar.	746	906	1,067	1,150	987	670
Apr.	689	773	896	1,018	817	618
May	688	809	933	971	789	623
June	786	924	1,077	1,114	888	642
July	619	746	783	860	719	563
Aug.	680	792	835	930	764	640
Sept.	822	938	1,009	1,115	772	773
Oct.	733	918	1,021	1,029	681	759
Nov.	722	894	1,002	912	659	713
Dec.	773	908	1,077	943	676	731
TOTAL	$8,508	$10,073	$11,518	$12,018	$9,621	$8,015
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	$ 209	$ 245	$ 331	$ 389	$ 384	$ 153
Feb.	202	280	355	422	360	158
Mar.	272	333	460	477	411	176
Apr.	243	305	343	446	303	151
May	256	323	375	411	296	136
June	293	351	476	509	409	183
July	208	268	327	367	250	112
Aug.	215	285	311	325	257	113
Sept.	264	347	411	442	276	132
Oct.	267	380	440	407	201	145
Nov.	274	361	400	408	194	148
Dec.	310	399	463	491	284	238
TOTAL	$3,013	$3,877	$4,692	$5,096	$3,604	$1,845

(a) Adjusted for trading-day and calendar month variation.
(b) Shipments of new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1977-83" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The cyclical nature of the machine tool industry is apparent in both new orders and shipment figures. Shipments totaled almost $2.5 billion by 1975, dropped by 16% in 1976, and grew to almost $5.1 billion in 1981. In 1982 shipments fell 29% and declined another 49% to 1.8 billion in 1983.

NET NEW ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1978 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1978	1979	1980	1981	1982	1983
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$ 616	$ 820	$ 1,056	$ 898	$ 681	$ 498
Feb.	874	1,002	1,210	948	602	608
Mar.	866	1,099	1,282	1,059	597	602
Apr.	745	1,001	921	880	541	610
May	910	978	860	742	562	653
June	916	1,003	1,064	891	755	681
July	835	970	764	648	529	626
Aug.	931	1,005	664	807	640	764
Sept.	850	1,278	943	781	525	728
Oct.	818	1,096	900	790	566	835
Nov.	953	1,049	806	648	523	751
Dec.	815	940	970	475	538	637
TOTAL	$10,129	$12,241	$11,440	$9,567	$7,059	$7,993
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	—	—	—	$ 291	$ 205	$ 92
Feb.	—	—	—	280	164	98
Mar.	$ 940	$ 1,471	$ 1,517	350	138	126
Apr.	—	—	—	320	151	119
May	—	—	—	229	106	135
June	1,130	1,356	1,335	318	126	145
July	—	—	—	192	107	175
Aug.	—	—	—	214	87	137
Sept.	1,028	1,353	818	187	87	156
Oct.	—	—	—	216	119	203
Nov.	—	—	—	196	88	160
Dec.	1,251	1,440	984	152	121	151
TOTAL	$4,349	$5,621	$4,754	$2,945	$1,498	$1,696

(a) Adjusted for trading-day and calendar month variation.
(b) Net new orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1977-83" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The most dramatic indicator of the cyclical nature of the machine tool business is new orders. These generally follow the overall movement of the economy but the cycles involved are much more pronounced. For example in 1975 new orders were only 45% of the level experienced in 1973. However, the economic recovery following the 1974 recession was especially strong in the machine tool sector and by 1979 orders running at record levels, well in excess of $5 billion per year. This strength in machine tool orders continued into early 1980, and then began a long, steady decline until late 1982. As a mark of the severity of the recession, machine tool orders for 1982 were only 27% of their 1979 record total. Monthly order placements demonstrated gradual improvement throughout 1983, but still ended up only 13% ahead of 1982. The failure of the industry to experience a recovery in step with the general economy has threatened the future of many domestic machine tool building firms.

UNFILLED ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1978 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1978	1979	1980	1981	1982	1983
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$3,730	$5,485	$7,721	$7,422	$4,723	$2,256
Feb.	3,938	5,676	7,937	7,279	4,372	2,219
Mar.	4,058	5,869	8,132	7,188	3,982	2,151
Apr.	4,114	6,097	8,155	7,050	3,706	2,143
May	4,336	6,266	8,082	6,821	3,479	2,173
June	4,466	6,345	8,069	6,598	3,346	2,212
July	4,682	6,569	8,070	6,386	3,156	2,275
Aug.	4,933	6,782	7,899	6,263	3,032	2,399
Sept.	4,961	7,122	7,833	5,929	2,785	2,354
Oct.	5,046	7,300	7,712	5,690	2,670	2,430
Nov.	5,277	7,455	7,516	5,426	2,534	2,468
Dec.	5,319	7,487	7,409	4,958	2,396	2,374
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	—	—	—	$5,353	$3,122	$1,133
Feb.	—	—	—	5,211	2,926	1,072
Mar.	$2,565	$4,257	$5,760	5,083	2,653	1,021
Apr.	—	—	—	4,956	2,500	989
May	—	—	—	4,773	2,310	988
June	2,904	4,635	5,902	4,583	2,027	950
July	—	—	—	4,408	1,883	1,013
Aug.	—	—	—	4,296	1,713	1,037
Sept.	3,244	5,089	5,770	4,042	1,524	1,062
Oct.	—	—	—	3,852	1,442	1,119
Nov.	—	—	—	3,639	1,337	1,131
Dec.	3,644	5,388	5,451	3,300	1,194	1,045

(a) Adjusted for trading-day and calendar month variation.

(b) Unfilled orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1977-83" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

Because they must incorporate a variety of customer-specified options, machine tools are generally "built to order" rather than being built for inventory. This order-taking procedure results in the backlog of unfilled orders, machines ordered by customers but not yet shipped, for which statistics appear above. The backlog of unfilled orders for machine tools, which had increased continuously for four years, peaked in mid-1980 at just over $5.6 billion. Since then, the slack pace of the economy has seen builders reduce the size of the accumulated volume of unfilled orders to $1.0 billion by the end of 1983.

PRODUCER PRICE INDEXES
For Selected Machine Tool Materials and Components

1967 = 100, unless otherwise indicated

Commodity	1975	1976	1977	1978	1979	1980	1981	1982(r)	1983
Finished Goods	163.4	170.3	180.6	194.6	216.1	247.0	269.8	280.7	285.2
All Commodities	174.9	182.9	194.2	209.3	235.6	266.8	293.4	299.3	303.1
Industrial Commodities	171.5	182.3	195.1	209.4	236.5	274.8	304.1	312.3	315.7
Manufactured Durables	165.6	175.5	188.1	204.7	226.1	250.8	269.7	279.8	287.3
Industrial Power, 500 KW Demand	209.7	226.9	257.0	279.5	305.3	368.1	422.2	473.1	487.8
Lubricating Oil Materials	266.5	265.1	304.3	349.5	477.9	756.4	873.6	877.2	787.5
Prepared Paint	166.9	174.2	182.4	192.3	204.4	235.3	249.8	262.8	264.7
Iron and Steel	200.9	215.8	230.4	253.6	283.5	305.2	333.8	339.0	343.4
Steel Mill Products	197.2	209.7	229.9	254.5	280.4	302.7	337.6	349.5	352.8
Semi-finished Steel Products	206.7	223.0	243.6	270.5	294.3	325.6	359.3	370.2	370.6
Finished Steel Products	196.6	208.9	229.0	253.5	279.5	301.2	336.2	348.0	349.9
Foundry and Forge Shop Products	194.3	218.3	230.5	249.5	277.1	310.0	329.8	345.5	351.1
Gray Iron Castings	180.1	199.7	211.1	225.1	245.5	270.7	NA	NA	NA
Steel Castings	196.8	216.3	234.4	257.3	291.9	327.8	NA	NA	NA
Gray & Ductile Iron Cast Dec. 1980 = 100	NA	NA	NA	NA	NA	NA	105.2	110.5	110.5
Nonferrous Metals	171.6	181.5	195.4	207.8	261.7	305.0	285.8	263.6	276.1
Primary Metal Refinery Shapes	184.8	191.6	206.0	218.3	295.4	377.2	326.1	284.3	303.7
Mill Shapes	180.9	194.1	213.1	229.9	270.4	292.7	304.1	301.5	310.8
Aluminum Shapes	163.8	176.8	202.1	226.5	247.3	266.7	293.4	298.5	305.2
Wire and Cable	152.3	151.3	156.1	155.2	136.5	217.6	207.5	202.5	204.0
Metalworking Machinery and Equipment	171.6	182.7	198.5	217.0	241.3	274.4	301.3	320.9	326.5
Cutting Tools & Access.	146.0	153.9	172.0	187.5	206.8	233.2	256.3	271.1	274.7
Abrasive Products	163.9	177.8	193.4	205.6	223.4	252.5	276.5	296.8	304.5
Metal Cutting Machine Tools	177.1	190.9	206.3	231.5	266.9	313.5	344.8	368.5	376.3
Metal Forming Machine Tools	192.2	212.9	232.6	262.8	300.1	346.7	380.3	404.7	415.8
General Purpose Machy. & Equipment	178.5	189.7	201.8	216.6	236.4	264.6	288.7	304.0	308.2
Pumps, Compressors, & Equipment	187.4	197.9	211.6	228.0	249.1	287.7	324.5	347.3	347.4
Fluid Power Equipment, Dec. 1970 = 100	135.0	143.8	152.7	163.3	176.2	199.6	222.3	244.3	252.9
Fluid Power Pumps, Dec. 1970 = 100	133.4	143.0	152.0	161.7	174.9	198.6	223.9	245.1	257.2
Fluid Power Valves, Dec. 1971 = 100	127.2	134.2	142.6	150.3	162.1	180.5	200.1	222.4	226.0
Cylinders, Dec. 1971 = 100	133.7	142.3	151.1	164.3	177.7	205.5	230.1	255.9	273.0
Fluid Power Hose and Tube Fittings, Dec. 1972 = 100	135.8	143.3	151.3	166.5	178.0	204.3	223.5	238.4	239.5
Mechanical Power Transmission Equipment	173.7	185.1	196.6	213.0	234.6	264.0	294.8	312.4	315.8
Miscellaneous General Purpose Equipment	185.7	195.6	206.9	222.7	246.4	279.4	307.0	323.5	325.0
Ball & Roller Bearings	164.2	176.4	191.4	206.3	227.0	265.1	304.8	331.5	331.7
Electrical Machinery and Equipment	140.7	146.6	154.1	164.9	178.9	201.7	220.2	231.6	240.1
Motors, Generators, Motor Generator Sets	174.9	193.0	202.2	218.1	234.6	266.3	296.1	309.8	329.5
Electric Motors	166.8	179.2	192.5	207.3	229.0	252.3	278.8	293.9	NA
Transformers and Power Regulators	134.5	138.4	146.5	155.2	164.3	182.7	208.8	221.7	223.3
Switchgear, Switchboard, etc. Equipment	154.5	161.9	173.9	184.0	200.0	233.0	250.8	263.8	272.4
Electronic Components and Accessories	115.5	115.4	119.5	126.9	135.8	156.3	168.1	176.1	183.6

NA - Not Available.

Note: The individual commodities shown are selected components of each major commodity grouping. All indexes are annual averages.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

NATIONAL DEFENSE PURCHASES
IMPLICIT PRICE DEFLATORS
By Major Type of Product, 1973 to Date

(Index 1972 = 100)

Year	Total Purchases	Durables Goods	Non-Durable Goods	Services (a)	Structures	Compensation
1973	106.6	102.9	112.6	105.8	113.2	107.4
1974	115.1	104.6	170.4	116.3	126.5	113.0
1975	124.9	114.9	190.9	130.7	138.5	120.9
1976	132.4	124.2	205.8	141.0	144.3	126.9
1977	141.9	135.4	225.6	154.2	150.5	134.0
1978	152.7	148.2	243.4	165.0	160.9	143.1
1979	166.0	164.3	298.1	177.1	183.5	152.2
1980(r)	187.5	184.0	437.8	196.7	205.0	165.2
1981(r)	209.3	205.8	488.4	217.1	221.2	185.2
1982(r)	227.7	228.4	488.3	234.8	224.3	201.9
1983(p)	237.7	243.1	449.2	247.1	229.5	209.7

r - Revised. p - Preliminary.

(a) Services excluding compensation.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

NATIONAL DEFENSE PURCHASES
By Major Type of Product, 1973 to Date

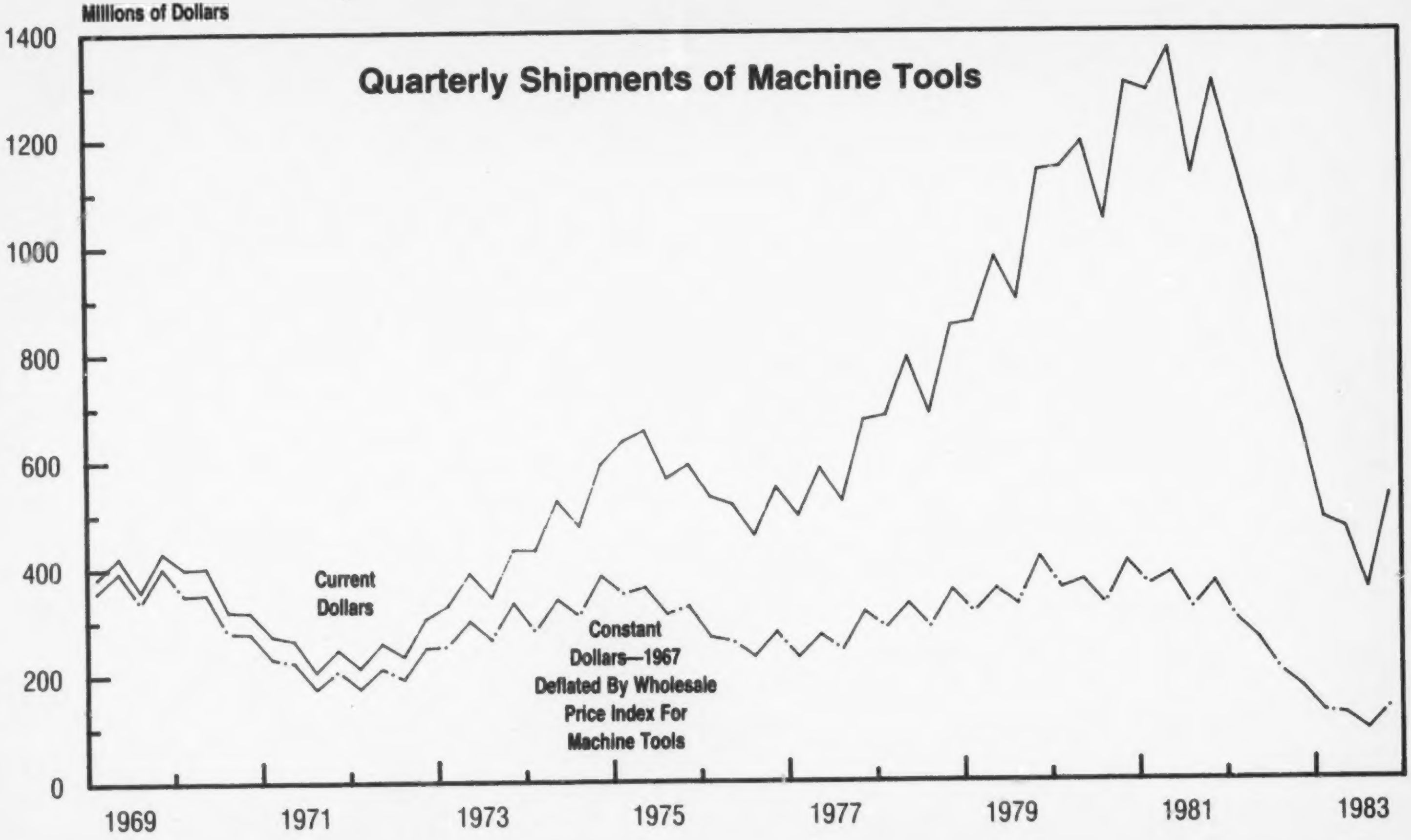
Year	Total Purchases	Durable Goods	Non-Durable Goods	Services (a)	Structures	Compensation
In Current Dollars (Billions)						
1973	$ 72.8	$14.1	$ 4.2	$15.9	$2.4	$36.3
1974	77.0	14.3	5.4	17.3	2.3	37.7
1975	83.0	17.6	5.3	17.8	2.5	39.8
1976	86.0	18.6	4.7	19.5	2.3	40.9
1977	92.8	22.3	5.0	20.3	2.4	42.8
1978	100.3	24.1	5.5	22.1	2.5	46.1
1979	111.8	29.0	6.6	25.1	2.5	48.7
1980(r)	131.2	33.5	10.7	30.7	3.2	53.1
1981(r)	154.0	40.4	12.6	36.6	3.2	61.3
1982(r)	179.4	49.6	13.7	43.8	3.8	68.4
1983(p)	200.3	59.2	13.8	51.0	4.5	71.8
In Constant 1972 Dollars (Billions)						
1973	$ 68.3	$13.7	$3.7	$15.0	$2.1	$33.8
1974	66.9	13.7	3.2	14.9	1.8	33.3
1975	66.4	15.4	2.8	13.6	1.8	32.9
1976	64.9	15.0	2.3	13.8	1.6	32.3
1977	65.4	16.5	2.2	13.2	1.6	32.0
1978	65.7	16.2	2.2	13.4	1.6	32.2
1979	67.4	17.7	2.2	14.2	1.4	32.0
1980(r)	70.0	18.2	2.4	15.6	1.5	32.2
1981(r)	73.6	19.6	2.6	16.9	1.5	33.1
1982(r)	78.8	21.7	2.8	18.7	1.7	33.9
1983(p)	84.3	24.3	3.1	20.7	1.9	34.2

p - Preliminary. r - Revised.

(a) Services excluding compensation.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

The estimates in the above tables are from a report prepared by the Bureau of Economic Analysis (BEA). Prior to 1980, the BEA included only Department of Defense purchases in the defense spending series. Beginning in 1980, their statistics include defense activities of other Federal agencies as well. These tables have been revised to reflect that change.



Quarterly Shipments of Machine Tools

PRODUCER PRICE INDEXES FOR MACHINE TOOLS

1948 to Date

1967 = 100

Year	All Commodities	Durable Manufactures	Total (a) Machine Tools	Metal Cutting Machine Tools	Metal Forming Machine Tools
1948	82.8	65.3	39.9	38.8	43.1
1949	78.7	67.3	47.2	41.2	45.1
1950	81.8	69.6	45.5	44.2	49.0
1951	91.1	76.3	52.7	51.6	55.7
1952	88.6	76.7	56.1	55.3	58.5
1953	87.4	78.4	56.9	55.8	59.8
1954	87.6	79.4	57.2	56.1	60.4
1955	87.8	82.2	60.1	58.3	65.2
1956	90.7	87.5	68.1	66.3	73.7
1957	93.3	90.9	72.8	71.3	77.8
1958	94.6	92.1	74.0	72.7	76.9
1959	94.8	94.0	75.2	74.3	77.5
1960	94.9	94.1	77.4	76.5	79.6
1961	94.5	93.6	79.0	78.8	79.5
1962	94.8	93.5	80.8	80.5	81.4
1963	94.5	93.6	81.1	80.8	81.9
1964	94.7	94.6	84.1	83.9	84.4
1965	96.6	95.8	88.6	88.3	89.3
1966	99.8	97.9	94.4	94.1	95.6
1967	100.0	100.0	100.0	100.0	100.0
1968	102.5	103.5	103.3	103.0	104.1
1969	106.5	107.7	107.1	106.8	107.4
1970	110.4	112.0	114.1	113.5	115.6
1971	113.9	117.0	118.2	117.1	121.0
1972	119.1	121.1	121.7	120.2	125.3
1973	134.7	127.4	129.6	128.2	133.0
1974	160.1	148.6	153.9	152.0	161.7
1975	174.9	165.6	180.5	177.1	192.2
1976	182.9	175.5	196.5	190.9	212.9
1977	194.2	188.0	213.3	206.3	232.6
1978	209.3	204.7	238.5	231.5	262.8
1979	235.6	226.1	273.2	266.9	300.1
1980	268.8	250.8	319.0	313.5	346.7
1981	293.4	269.7	353.4	344.8	380.3
1982(r)	299.3	279.8	379.0	368.5	404.7
1983	303.1	287.3	389.0	376.3	415.8

r - Revised.

(a) Constructed by NMTBA from BLS producer price indexes for metal cutting and metal forming machine tools using NMTBA net new order weights.

Source: U.S. Dept. of Labor, Bureau of Labor Statistics: U.S. Dept. of Commerce, "Business Statistics, 1977," "Survey of Current Business" (monthly), and NMTBA.

Because of the continuous technological improvement in machine tools and the increasing number of "custom built" machines, reliable wholesale price indexes (which are intended to measure price changes not influenced by changes in quality, product mix, etc.) are difficult to develop. The data should be used with caution.

SHIPMENTS OF MACHINE TOOLS AT CONSTANT PRICES

1947 to Date

(In 1983 Dollars)

Year	Metal Cutting		Metal Forming (a)	
	Current Dollars (Thousands)	1983 Dollars (Thousands)	Current Dollars (Thousands)	1983 Dollars (Thousands)
1947	$ 306,000	$3,357,104	—	—
1948	288,450	2,797,498	—	—
1949	249,150	2,275,550	—	—
1950	305,550	2,601,311	—	—
1951	632,250	4,610,925	—	—
1952	1,125,900	7,661,268	—	—
1953	1,191,200	8,032,908	—	—
1954	891,750	5,981,688	—	—
1955	670,400	4,327,115	—	—
1956	945,200	5,364,663	$ 432,100	$2,437,800
1957	900,150	4,750,633	342,550	1,830,741
1958	438,400	2,269,151	152,800	826,214
1959	440,600	2,231,451	175,400	941,038
1960	541,500	2,663,551	202,500	1,057,773
1961	541,250	2,584,643	209,650	1,096,496
1962	612,850	2,864,722	208,400	1,064,514
1963	638,450	2,973,407	257,300	1,306,290
1964	844,650	3,788,348	319,700	1,575,032
1965	1,022,550	4,357,767	403,050	1,876,659
1966	1,221,750	4,885,632	463,450	2,015,701
1967	1,353,200	5,092,004	452,750	1,882,536
1968	1,358,300	4,962,370	368,600	1,472,280
1969	1,192,450	4,201,430	405,100	1,568,331
1970	992,900	3,291,890	450,150	1,619,128
1971	672,300	2,160,416	325,600	1,118,862
1972	714,450	2,236,640	304,250	1,009,623
1973	1,073,750	3,151,692	427,250	1,335,699
1974	1,445,850	3,579,457	584,700	1,503,510
1975	1,878,650	3,991,692	573,050	1,239,724
1976	1,482,100	2,921,488	577,550	1,127,961
1977	1,650,800	3,011,145	629,950	1,126,117
1978	2,188,500	3,557,380	824,950	1,305,239
1979	2,930,050	4,131,078	946,500	1,311,414
1980	3,680,800	4,418,144	1,010,950	1,212,446
1981	4,104,500	4,479,477	991,100	1,083,619
1982	2,894,750	2,956,028	709,650	729,117
1983	1,371,500	1,371,500	473,550	473,550

(a) Shipment data not available prior to 1956.

Note: 1983 dollar values developed from the Producer Price Index (formerly Wholesale Price Index) for metal cutting and metal forming machine tools.

Source: U.S. Department of Labor, Bureau of Labor Statistics, NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

When converted to constant dollars, the apparent record shipments in recent years disappear. For the years shown above, the historical constant dollar average for metal cutting is $3,780,896 and for metal forming is $1,003,964.

2

WORLD ECONOMY

The tables in this chapter are intended to provide a perspective of the U.S. position in the world economy. The picture has changed dramatically in the past twenty years as the rate of economic growth in many of the world's industrialized nations has surpassed that of the U.S. and their per capita income is approaching the levels achieved domestically. Also, the changes in the world's economic structure brought about by OPEC and the growth of many developing nations into newly industrialized powers have led to major shifts in the balance of economic power in the world. The rise to wealth of these developing nations has been accompanied by a substantial increase in world trade. Increasing specialization by these and the major industrial nations has created an environment of interdependence in which each nation is but a piece of the larger world economic puzzle.

Trends in growth rates in selected industrialized countries are presented in tables on Gross National Product, Real Gross National Product, and Industrial Production. Factors underlying these growth trends are found in the tables on international investment patterns and various tables of comparative prices, wages, productivity, and unit labor costs. The data and charts on cost recovery allowable for tax purposes on machinery and equipment in selected industrial countries are especially interesting. These graphically demonstrate how our industrial competitors are able to invest more than the average American firm, and by inference, they also demonstrate why the U.S. rate of productivity growth in recent years has been considerably lower than that of our major competitors.

Growth in the world economy and world trade has brought about a growing interest in the balance of payments positions of the various countries. A nation's balance of payments is considered a key indicator of the health or weakness of an individual economy. The same can be said for an industry trading in the world marketplace. In recent years disparate inflation rates, exchange rate movements, the phasing of national business cycles, and energy related problems have caused dislocations in many nations' and industries' balance of payments positions.

Since 1975, the overall United States balance of trade has moved from a small surplus to record deficits. Until 1978, the U.S. machine tool industry remained in surplus in its world trade position though the relative size of the surplus had been declining throughout the 1970's. Record high machine tool imports by U.S. manufacturers, combined with relatively small increases in machine tool exports, led to substantial balance of trade deficits in machine tool trade from 1978 through the present. In a little over a decade, the share of the domestic market represented by imports has grown from a negligible amount to almost one-third of total U.S. machine tool consumption.

The tables in this chapter provide comparative international statistics on world trade, balance of trade, balance of payments and export prices.

GROSS NATIONAL PRODUCT (r)

(Billions of U.S Dollars)

	1974	1975	1976	1977	1978	1979	1980(a)	1981	1982	1983
WORLD	$6,000	$6,250	$6,800	$7,500	$7,500	$8,450	$9,450	$11,600	$12,600	$13,400E
Of which:										
United States	1,434	1,549	1,718	1,918	2,164	2,418	2,632	2,954	3,073	3,311
Canada	151	163	194	198	204	226	254	283	289	315
Japan	459	498	559	687	963	999	1,040	1,143	1,063	1,156
European Comm.(b)	1,202	1,399	1,448	1,640	2,040	2,472	2,819	2,473	2,368E	2,297E
United Kingdom	198	234	227	253	321	415	529	513	485	457
France	267	339	352	385	476	577	658	572	543	518E
West Germany	381	418	446	515	642	761	817	683	658	653
Italy	170	191	188	215	262	326	396	351	346	350
U.S.S.R.(a)	784	903	975	1,066	1,152	1,253	1,393	1,587	1,711	1,843
China(a)	263	307	323	142	179	215	244	228	225	236
PER CAPITA WORLD	$1,478	$1,519	$1,629	$1,765	$1,727	$1,912	$2,110	$2,545	$2,716	$2,836E
United States	6,707	7,173	7,879	8,710	9,721	10,743	11,558	12,852	13,242	14,129
Canada	6,734	7,152	8,413	8,490	8,666	9,519	10,585	11,619	11.736	12,671
Japan	4,162	4,466	4,955	6,031	8,383	8,621	8,907	9,712	8,975	9,700
European Comm. (b)	4,506	5,231	5,407	6,109	7,581	9,158	10,408	9,110	8,743E	8,466E
United Kingdom	3,534	4,194	4,069	4,529	5,746	7,425	9,457	9,188	8,697	8,196
France	5,087	6,431	6,659	7,251	8,934	10,785	12,260	10,592	10,015	9,502E
West Germany	6,139	6,763	7,251	8,391	10,475	12,390	13,277	11,070	10,682	10,594
Italy	3,068	3,425	3,338	3,807	4,615	5,727	6,941	6,138	6,143	6,206
U.S.S.R.(a)	3,109	3,548	3,797	4,116	4,409	4.757	5,247	5,928	6,337	6,768
China (a)	282	323	333	149	184	219	246	226	220	229

E - Estimate. r - Revised.

(a) Data for the China series prior to 1977 and for the USSR series are reported in U.S. purchasing power equivalents. Data for the China series from 1977 through the present are GDP figures obtained from Chinese agencies.

(b) Data for the European Economic Community (EEC) on this table contains statistics for only the original six member countries in order to maintain comparability of the time series.

Source: International Monetary Fund, "International Financial Statistics", Department of Commerce, Industry and Trade Administration.

REAL GNP TRENDS (r)

(1980 = 100)

	United States	Canada	Japan	European Community(a)	United Kingdom(a)	France(a)	West Germany	Italy(a)
1963	56	46	29	54	68	48	55	52
1964	59	49	33	58	71	51	58	53
1965	63	53	36	60	73	55	62	55
1966	67	56	40	62	75	57	63	58
1967	69	58	45	64	77	59	63	62
1968	72	62	50	67	80	62	67	66
1969	74	65	56	71	81	66	72	70
1970	74	67	62	75	83	70	76	73
1971	76	71	65	78	85	74	78	75
1972	80	76	71	81	87	78	81	77
1973	85	81	77	85	93	82	85	83
1974	84	84	76	87	92	85	85	86
1975	83	85	78	86	92	85	84	83
1976	88	90	82	90	95	89	89	88
1977	93	93	86	92	97	92	91	89
1978	98	96	91	95	100	96	94	92
1979	100	99	95	99	102	99	98	96
1980	100	100	100	100	100	100	100	100
1981	103	103	104	100	99	100	100	100
1982	101	99	107	100	101	102	99	100
1983	104	102	111	NA	105	103	100	99

NA - Not Available. r - Revised.

(a) Gross Domestic Product.

Source: International Monetary Fund, "International Financial Statistics;" Organization for Economic Cooperation and Development.

INTERNATIONAL INVESTMENT PATTERNS (r)

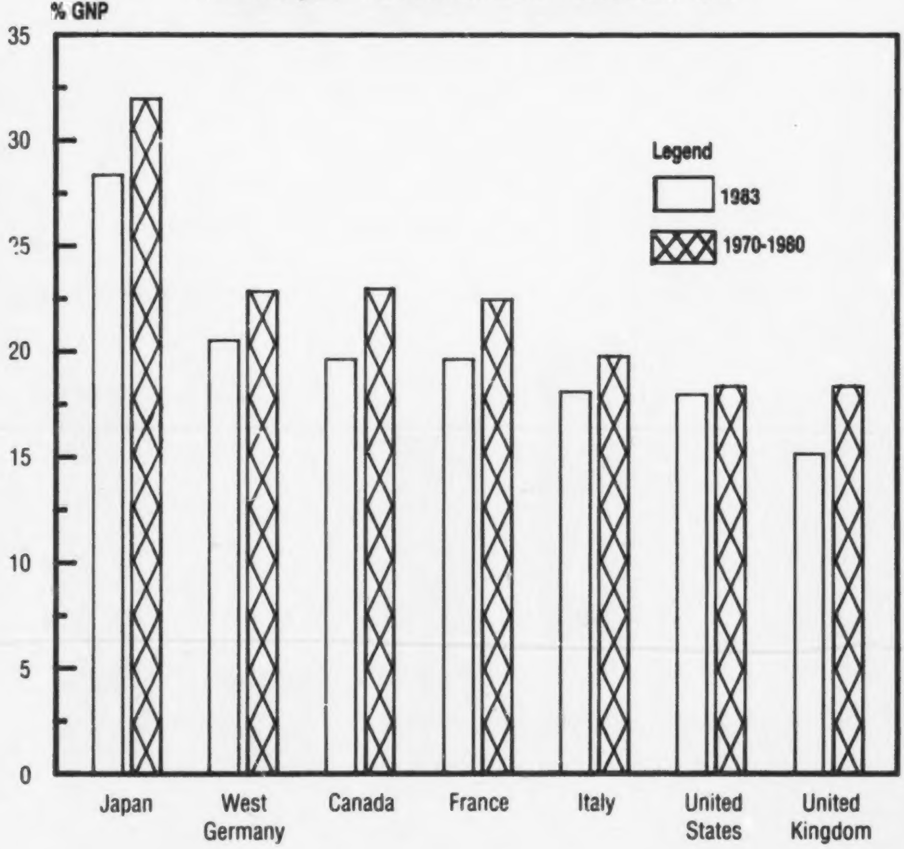
	Gross Fixed Capital Formation as Percent of GNP				
	1983	1982	1981	1980	1970-1980
United States	18.0%	16.3%	17.7%	15.2%	18.3%
Italy	18.1	19.2	20.3	19.8	19.8
United Kingdom	15.1	15.3	15.4	17.3	18.3
Canada	19.7	21.8	24.2	23.3	23.0
West Germany	20.5	20.5	21.9	22.7	22.8
France	19.7	20.6	21.2	21.6	22.5
Japan	28.4	29.9	31.1	32.0	32.6

Note: Fixed Capital Formation consists of non-residential structures and producers durable equipment as well as residential structures.

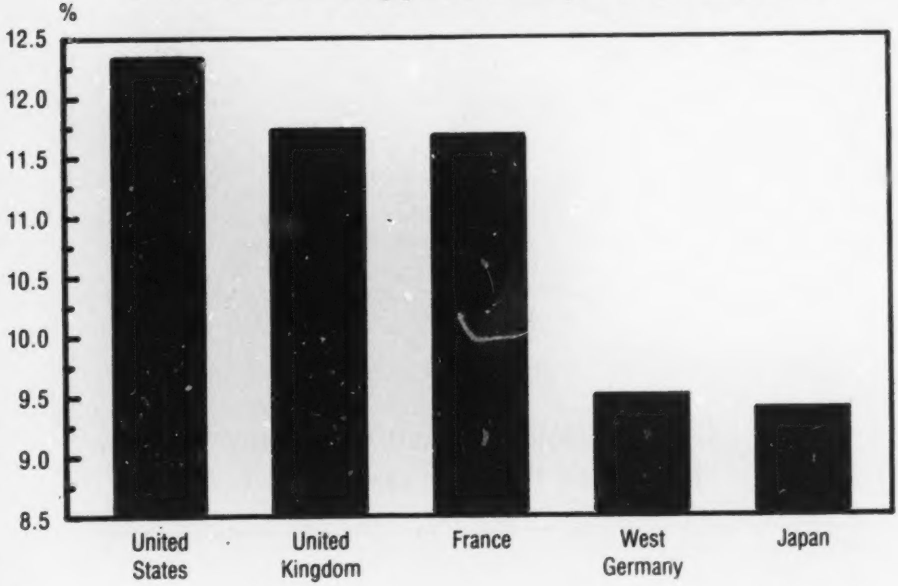
Source: International Monetary Fund, "International Financial Statistics;" U.S. Department of Commerce.

The comparatively low percentage of the total Gross National Product (GNP) which is invested in fixed capital in the United States is one reason for its slower industrial growth. The additional fact that a smaller percentage of this investment is made in industry is another reason for concern for the industrial leadership of the United States.

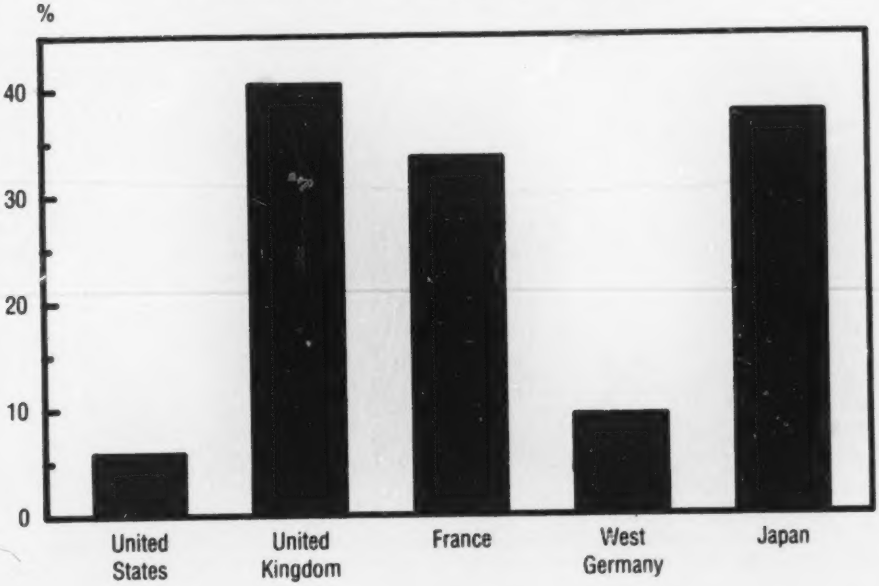
International Investment Patterns
Fixed Capital Formation as a Percent of GNP



Long Term Interest Rates on Government Supported Export Credit, 1982



Percent of Exports Receiving Official Fiancing Support, 1982



U.S. DIRECT INVESTMENT (a) ABROAD BY MAJOR INDUSTRY AND COUNTRY—YEAR END 1982

(Billions of U.S. Dollars)

	Total	Manufacturing	Mining and Smelting	Petroleum	Other
Developed Countries	$163.1	$71.4	$3.8	$35.8	$52.1
Canada	44.5	19.7	2.2	8.7	14.0
Europe	99.9	44.1	Z	23.0	32.8
European Community	78.3	40.3	Z	19.0	19.0
United Kingdom	30.8	12[illegible]	D	9.2	D
France	7.8	4.[illegible]	Z	1.1	D
West Germany	15.9	10.1	Z	3.2	2.6
Other EEC	23.8	12.5	D	5.5	D
Other Europe	21.5	3.8	Z	3.9	13.8
Japan	6.9	3.5	0.0	1.7	D
Australia, New Zealand, South Africa	11.8	4.1	1.6	2.5	D
Developing Countries	53.2	19.3	2.8	16.0	15.0
Latin America	33.0	15.6	2.3	6.5	8.7
Middle East (b)	2.7	0.2	D	1.1	D
Other Africa (c)	5.1	0.5	0.4	3.5	0.7
Other Asia and Pacific	12.3	2.9	D	4.9	D
Other Countries	5.1	–	–	3.8	1.3
Total	$221.3	$90.7	$6.6	$52.1	$68.4

D - Withheld to avoid disclosure. Z - Less than $50 million.

(a) Book value.

(b) Includes Bahrain, Iran, Israel, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, South Yemen, Syria, United Arab Emirates, Oman and Yemen.

(c) Includes United Arab Republic (Egypt).

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business," August 1983.

INDUSTRIAL PRODUCTION (a,r)

(1980 = 100)

Year	United States	Canada	Japan	EEC(b)	United Kingdom	France	West Germany	Italy
1963	52.0	47.0	26.6	54.5	74.5	53.0	57.0	47.1
1964	55.6	51.5	30.9	58.5	80.8	60.0	62.0	47.5
1965	61.1	55.9	32.0	60.9	83.3	58.0	65.0	49.8
1966	66.5	59.4	36.2	63.3	84.6	61.0	65.0	55.5
1967	68.0	61.5	43.3	64.3	85.5	62.0	63.0	60.0
1968	72.3	65.9	50.7	69.1	91.0	65.0	69.0	63.9
1969	75.6	70.1	58.8	75.6	93.4	71.0	79.0	66.4
1970	73.3	71.3	66.9	79.3	93.5	75.0	83.0	72.1
1971	74.6	73.8	68.6	81.1	93.6	80.0	85.0	72.0
1972	81.4	79.4	73.6	84.7	95.7	84.0	88.0	75.2
1973	88.3	87.8	84.6	90.9	102.7	90.0	92.0	82.5
1974	88.0	90.6	81.2	91.5	98.7	92.0	90.0	86.2
1975	80.1	85.2	72.3	85.4	93.9	86.0	84.0	78.3
1976	88.7	90.2	80.4	91.7	95.9	93.0	91.0	87.9
1977	93.9	92.5	83.7	93.8	100.1	95.0	93.0	88.9
1978	99.4	95.6	89.0	96.3	103.1	97.0	95.0	90.6
1979	103.7	101.5	95.5	100.8	107.0	102.0	100.0	95.2
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	102.6	100.9	101.0	97.8	96.7	98.0	98.0	97.8
1982	94.3	90.1	101.3	96.4	98.0	96.0	95.0	95.2
1983	100.4	95.4	104.9	96.5E	100.8	97.0	95.0	90.4

E - Estimate. r - Revised.

(a) Excludes construction.

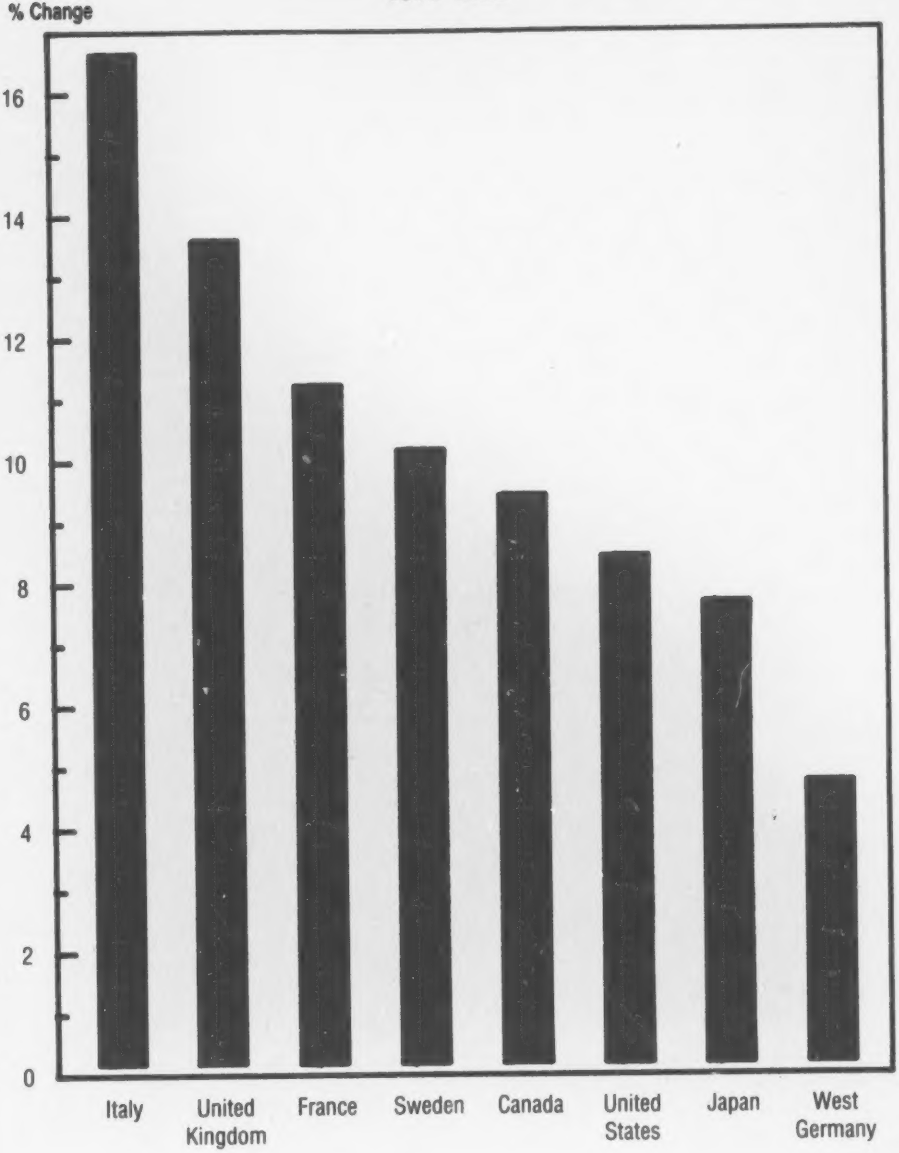
(b) Data for the European Economic Community (EEC) on this table contains statistics for Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, United Kingdom, and West Germany, and also includes Greece after 1980.

Source: International Monetary Fund, "International Financial Statistics," and "The Economic Report of the President, 1984."

Consumer Prices

Average Annual Percent Change

1973-1983



CONSUMER PRICES (r)
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1963	37.2	36.6	29.3	20.5	30.4	51.1	21.4	30.7
1964	37.6	37.3	30.4	21.2	31.3	52.1	22.7	31.7
1965	38.2	38.2	32.4	22.1	32.2	54.0	23.6	33.3
1966	39.4	39.6	34.0	23.0	33.0	55.9	24.2	35.4
1967	40.5	41.1	35.4	23.6	33.9	56.8	25.1	37.0
1968	42.2	42.7	37.3	24.7	35.5	57.8	25.5	37.7
1969	44.5	44.7	39.3	26.1	37.6	58.9	26.1	38.7
1970	47.1	46.1	42.3	27.7	39.9	60.9	27.4	41.4
1971	49.1	47.5	44.9	30.3	42.1	64.0	28.8	44.5
1972	50.8	49.7	46.9	32.5	44.7	67.6	30.4	47.2
1973	53.9	53.5	52.4	35.5	47.9	72.3	33.7	50.3
1974	59.8	59.3	65.2	41.1	54.5	77.4	40.1	55.3
1975	65.3	65.7	72.9	51.1	60.9	82.0	46.9	60.7
1976	69.1	70.7	79.7	59.6	66.8	85.5	54.8	67.0
1977	73.6	76.3	86.1	69.0	73.0	88.7	64.1	74.6
1978	79.2	83.2	89.4	74.7	79.4	91.1	71.9	82.0
1979	88.1	90.7	92.6	84.8	87.9	94.9	82.5	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	110.4	112.4	104.9	111.9	113.4	106.3	117.8	112.1
1982	117.1	124.6	107.7	121.5	126.8	111.9	137.2	121.7
1983	120.9	131.8	109.7	127.1	139.0	115.6	157.3	132.6

r - Revised.

Source: International Monetarv Fund, "International Financial Statistics."

WHOLESALE PRICES (r)
(1980 = 100)

Year	United States	Canada(a)	Japan	United Kingdom(b)	France(c)	West Germany(d)	Italy	Sweden(e)
1963	35.2	34.1	43.1	20.7	36.9	54.9	20.1	NA
1964	35.3	34.4	43.1	21.3	38.3	55.5	20.7	NA
1965	36.0	34.9	43.5	22.1	38.5	56.8	21.1	NA
1966	37.2	35.9	44.5	22.7	39.6	57.8	21.4	NA
1967	37.2	36.6	45.3	24.4	39.3	57.3	21.4	NA
1968	38.2	37.3	45.7	25.2	38.6	56.9	21.5	35.0
1969	39.7	38.7	46.7	26.2	42.8	57.9	22.3	36.0
1970	41.1	39.7	48.4	28.2	46.0	60.8	24.0	38.0
1971	42.4	40.4	48.0	30.6	46.9	63.4	24.8	39.0
1972	44.3	42.2	48.4	32.2	49.1	65.1	25.8	41.0
1973	50.1	47.0	56.0	34.6	56.3	69.4	30.2	46.0
1974	59.6	55.9	73.7	42.7	72.7	78.7	42.5	57.0
1975	65.1	62.2	75.9	52.1	68.6	82.3	46.1	61.0
1976	68.1	65.4	79.7	61.1	73.6	85.4	57.1	66.0
1977	72.3	70.5	81.2	72.0	77.7	87.7	66.5	73.0
1978	77.9	77.0	79.1	79.1	81.1	88.7	72.1	78.0
1979	87.7	88.1	84.9	87.7	91.9	93.0	83.3	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	109.1	110.2	101.4	109.6	111.0	107.8	116.6	111.0
1982	111.4	116.8	103.2	118.0	123.3	114.1	132.8	125.0
1983	112.9	120.9	100.9	124.5	136.9	115.8	146.8	139.0

NA - Not Available. r - Revised.

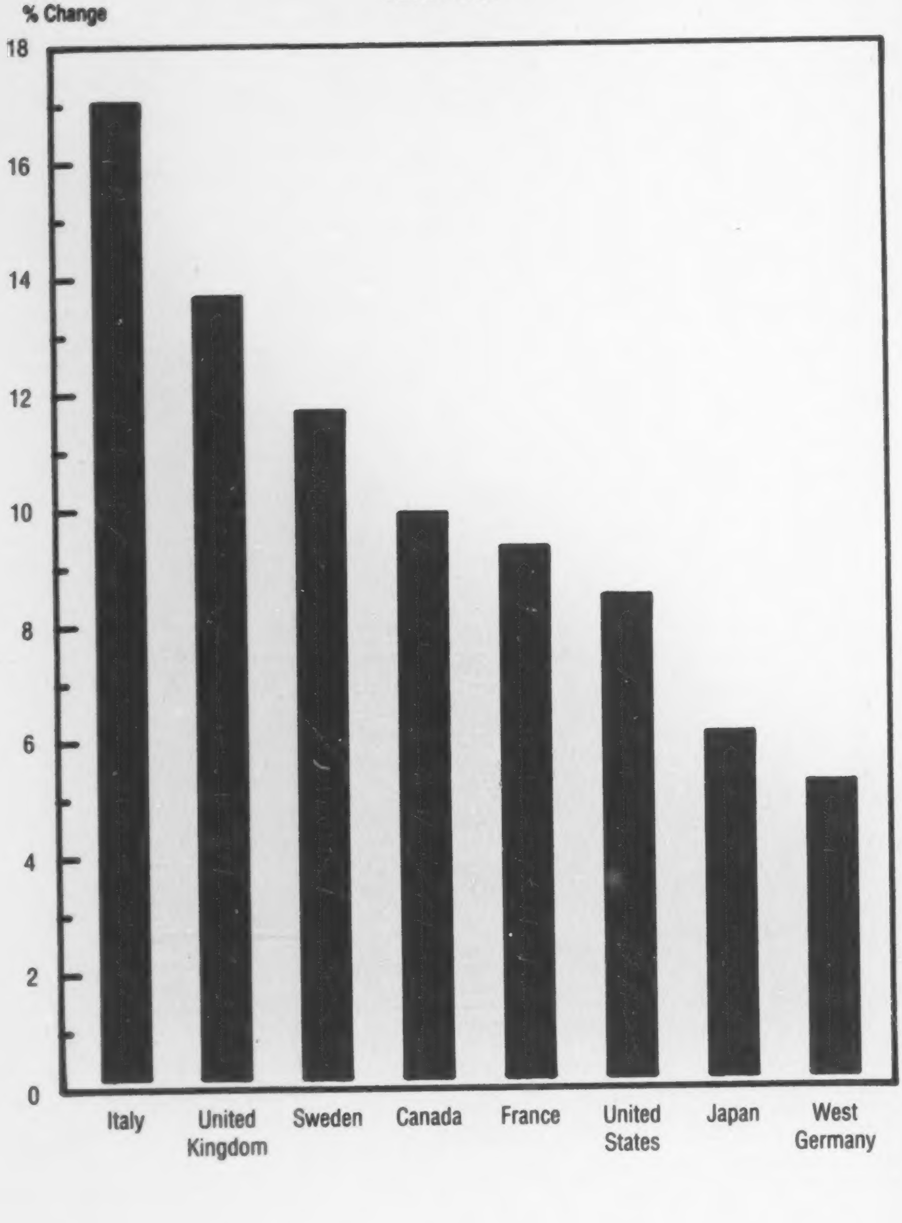
(a) Industrial selling prices.
(b) Manufacturing output prices.
(c) Industrial goods prices.
(d) Industrial products prices.
(e) Domestic supply prices.

Source: International Monetary Fund, "International Financial Statistics;" Department of Commerce, "International Economic Indicators."

Wholesale Prices

Average Annual Percent Change

1973-1983



UNIT VALUE OF EXPORTS (r)
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom(a)	France	West Germany(a)	Italy	Sweden
1967	34.7	31.5	54.8	22.1	35.4	61.8	20.6	33.0
1968	35.2	32.3	54.4	23.8	35.2	61.5	20.5	33.0
1969	36.2	33.0	56.9	24.6	37.8	63.4	21.4	34.0
1970	38.2	34.1	59.5	26.4	41.7	61.2	22.4	37.0
1971	39.4	34.4	60.7	27.9	44.1	63.5	23.6	39.0
1972	40.7	35.5	59.9	29.5	44.6	65.4	24.3	41.0
1973	47.4	40.5	63.6	33.2	49.0	68.4	28.8	45.0
1974	60.5	53.7	85.4	42.4	61.8	79.4	40.8	57.0
1975	67.6	59.5	87.4	51.9	65.2	86.2	45.3	66.0
1976	69.9	60.9	86.9	62.1	71.2	89.7	55.3	70.0
1977(a)	72.4	64.8	87.1	72.1	78.2	85.9	65.9	74.0
1978	77.4	70.6	82.2	79.0	82.2	86.7	70.7	78.0
1979	88.1	85.3	89.8	87.5	90.2	91.3	82.8	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	109.2	106.4	103.0	108.8	113.0	106.3	122.3	109.0
1982	110.4	106.9	108.4	116.6	129.0	110.9	141.7	123.0
1983	112.1	105.5	101.1	126.5	142.0	112.3	149.8	NA

r - Revised.

(a) Data for the United Kingdom and West Germany were recently revised, but the revised figures are still unavailable for years prior to 1977. There is therefore a discontinuity between the data prior to 1977 and the data for 1977 on.

Source: International Monetary Fund, "International Financial Statistics."

SOVIET UNION FOREIGN TRADE (a)
(Millions of U.S. Dollars)

	Exports			Imports		
Year	Total	Communist Countries (b)	Noncommunist Countries	Total	Communist Countries (b)	Noncommunist Countries
1964	$ 7,683	$ 5,407	$ 2,276	$ 7,737	$ 5,346	$ 2,390
1965	8,175	5,556	2,618	8,058	5,610	2,448
1966	8,841	5,873	2,968	7,913	5,264	2,649
1967	9,652	6,377	3,275	8,537	5,946	2,591
1968	10,634	7,134	3,500	9,410	6,367	3,043
1969	11,655	7,682	3,973	10,327	6,696	3,631
1970	12,800	8,367	4,433	11,732	7,636	4,095
1971	15,918	10,398	4,788	14,388	9,432	4,302
1972	16,312	10,608	6,768	17,049	10,913	6,216
1973	21,175	12,215	8,978	20,825	12,351	8,442
1974	27,374	14,641	12,733	24,861	13,601	11,260
1975	33,407	20,271	13,136	37,072	19,415	17,657
1976	37,550	22,040	15,510	38,542	20,246	18,296
1977	45,094	25,901	19,193	40,806	23,284	17,521
1978	52,432	31,244	21,188	50,798	30,494	20,305
1979	64,913	36,152	28,761	57,961	32,801	25,160
1980	76,470	41,463	35,007	68,477	36,424	32,052
1981	78,809	43,044	35,764	72,631	36,905	35,727
1982	86,940	46,985	39,955	77,644	42,415	35,229
1983	91,653	50,914	40,739	80,440	45,484	34,957

(a) Exports and imports are F.O.B.

(b) Up to 1980, the following are included in the Communist Countries category: Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, China, and Mongolian People's Republic. After 1980 the following are included in the category: Bulgaria, China, Cuba, Czechoslovakia, German Democratic Republic, Hungary, Korea, Laos, Mongolian People's Republic, Vietnam, and Yugoslavia.

Source: U.S. Department of Commerce, "Overseas Business Reports."

WORLD TRADE (a)
(Billions of U.S. Dollars)

	1980(r)		1981(r)		1982(r)		1983(p)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
United States(b)	$ 221	$ 257	$ 234	$ 273	$ 212	$ 255	$ 199	$ 268
Canada	68	63	73	70	71	58	75	62
Japan	130	141	152	143	138	132	146	123
European Community	666	729	612	645	590	616	605	626
United Kingdom	110	116	102	103	97	100	91	100
France	116	135	106	121	97	116	95	106
West Germany	193	188	176	164	176	155	166	152
Italy	78	100	75	91	74	86	73	81
Other developed	185	222	179	214	180	212	188	233
Less developed	585	516	584	590	509	545	474	511
OPEC	296	133	275	155	208	155	170	140
Other	288	383	309	434	300	390	304	371
Communist	202	200	205	200	223	203	237	217
Total(c)	$2,056	$2,128	$2,038	$2,136	$1,923	$2,020	$1,923	$2,041

p - Preliminary. r - Revised.

(a) Import values are cost, insurance, and freight (c.i.f.) except for Communist countries', which are free on board (f.o.b.).
(b) Exports include Department of Defense shipments.
(c) Individual items may not add to totals due to rounding.

Source: "Economic Report of the President," February 1984.

These figures show exports and imports of merchandise only.

U.S. TRADE WITH COMMUNIST COUNTRIES (a,c)
(Millions of U.S. Dollars)

	U.S. Exports			U.S. Imports		
	To Eastern Europe (b)	To USSR	To People's Republic of China	From Eastern Europe (b)	From USSR	From People's Republic of China
1962	$ 105.1	$ 20.2	Z	$ 62.6	$ 16.3	$ 0.2
1963	143.9	22.9	Z	60.3	21.2	0.3
1964	193.6	146.4	Z	77.8	20.7	0.5
1965	94.8	45.2	Z	94.8	42.6	0.5
1966	156.0	41.7	Z	129.1	49.6	
1967	135.0	60.3	Z	136.1	41.2	0.2
1968	157.3	57.7	Z	140.0	58.5	Z
1969	143.7	105.5	Z	144.0	51.5	Z
1970	234.9	118.7	Z	153.5	72.3	Z
1971	222.2	162.0	Z	165.8	57.2	4.9
1972	276.9	542.2	$ 63.5	225.0	95.5	32.4
1973	606.5	1,194.7	689.6	306.1	220.1	64.9
1974	823.4	609.2	807.4	539.4	350.4	114.7
1975	951.0	1,836.9	303.8	472.9	255.3	157.4
1976	1,189.7	2,305.9	135.4	646.2	220.6	201.9
1977	911.9	1,623.5	171.3	683.7	234.3	202.7
1978	1,420.2	2,249.0	818.2	969.8	540.4	324.0
1979	2,066.2	3,603.6	1,716.5	998.8	873.2	592.3
1980	2,339.8	1,509.7	3,749.0	982.0	452.9	1,058.3
1981	1,904.2	2,338.6	3,598.6	1,206.7	347.4	1,895.3
1982	1,012.8	2,583.7	2,912.1	839.4	227.6	2,283.7
1983	887.8	2,002.9	2,173.1	1,011.5	347.1	2,244.1

Z - Less than $50,000.

(a) Exports and imports are f.a.s. transaction values, except prior to 1974, where imports are customs values.
(b) Does not include Yugoslavia.
(c) Data for 1978 to the present are not directly comparable to prior years due to commodity schedule changes.

Source: U.S. Department of Commerce; "Overseas Business Reports."

BALANCE OF TRADE AND PAYMENTS

(Billions of U.S. Dollars)

	Balance of Trade (a)	Balance on Current Account (b)
United States (c)		
[illegible](r)	$-39.7	$ 4.5
1982(r)	-42.6	-11.5
1983E	-69.7	-41.0
Canada		
1981(r)	2.4	-4.8
1982(r)	12.8	2.5
1983E	12.9	2.5
Japan		
1981	8.6	5.1
1982(r)	6.9	7.0
1983E	22.6	22.5
United Kingdom		
1981(r)	-0.5	13.5
1982(r)	-2.6	9.3
1983E	-9.1	1.5
France		
1981(r)	-14.6	-4.8
1982(r)	-19.0	-12.2
1983E	-11.3	-5.3
West Germany		
1981(r)	12.2	-6.3
1982(r)	21.0	3.5
1980E	14.5	5.3
Italy		
1981(r)	-15.8	-8.4
1982(r)	-12.7	-5.6
1983E	-7.4	1.5

r - Revised. E Estimate.

(a) Balance of payments basis (exports f.o.b. less imports c.i.f.).
(b) Net exports of goods and services and unilateral transfers (OECD basis).
(c) Refer to Chapter 1 for historical chart of the United States balance of trade.

Source: "Economic Report of the President," February 1984.

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS IN MANUFACTURING

For Selected Years

(U.S. Dollars)

	1970	1975(r)	1980(r)	1981(r)	1982(r)	1983E	Percent Increase 1975-1983
United States	$4.20	$6.35	$ 9.89	$10.95	$11.68	$12.31	94%
Canada	3.46	6.10	8.91	9.80	10.68	11.41	87
United Kingdom	1.46	3.26	7.28	7.13	6.80	6.48	99
France	1.74	4.58	9.12	8.15	7.86	7.66	67
West Germany	2.32	6.19	12.33	10.54	10.44	10.39	68
Italy	1.75	4.65	8.13	7.39	7.36	7.68	65
Sweden	2.96	7.18	12.51	11.80	10.07	8.98	25
Japan	.99	3.05	5.61	6.18	5.70	6.24	105

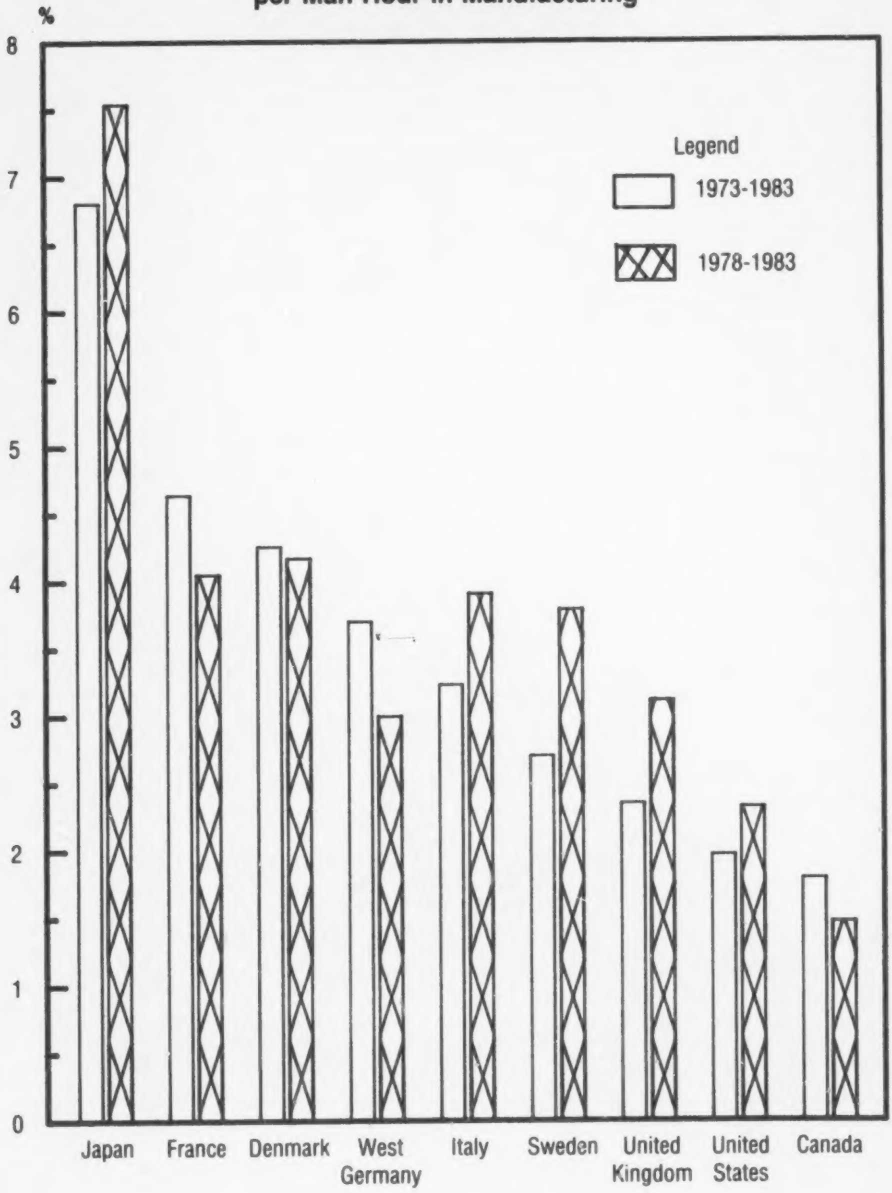
r - Revised. E - Estimate.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

For international comparisons of compensation in the machine tool industry, see Chapter 7.

Productivity

Average Annual Increase in Output per Man-Hour in Manufacturing



PRODUCTIVITY IN MANUFACTURING (r)
Selected Countries, 1965 to Date
Indexes: 1977 = 100

	United States	Canada	Japan	France	West Germany	Italy	United Kingdom
Unit Labor Cost (a)							
1965	57.5	50.8	37.4	48.4	32.7	41.2	51.7
1966	59.4	53.0	37.4	47.4	34.2	40.4	54.1
1967	62.4	55.2	36.5	48.0	33.9	42.5	52.5
1968	64.6	55.5	37.9	48.9	33.7	42.0	45.7
1969	68.0	56.4	39.1	47.0	35.1	44.3	48.6
1970	72.7	61.7	41.3	46.8	43.2	50.6	55.0
1971	72.7	64.1	46.4	50.3	48.9	57.5	62.0
1972	73.0	67.0	55.2	57.1	55.4	64.5	66.6
1973	74.2	68.8	68.6	70.4	71.0	73.1	68.4
1974	84.1	79.7	81.7	74.5	79.5	77.6	81.1
1975	91.5	89.8	90.4	99.5	89.2	104.3	101.9
1976	94.6	100.7	88.2	96.3	87.6	90.5	93.3
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	107.4	98.1	126.2	117.3	121.6	115.6	124.0
1979	117.0	103.0	117.9	135.5	136.2	129.5	157.9
1980	130.5	116.3	111.8	153.6	147.5	141.4	212.7
1981	138.5	127.8	116.7	135.3	124.9	127.2	203.4
1982	148.5	142.7	100.2	123.8	120.3	123.7	186.1
1983	147.4	143.6	102.7	114.7	113.3	127.7	164.5
Hourly Compensation (a)							
1965	42.8	31.8	12.4	23.7	17.7	21.8	33.1
1966	44.8	34.4	13.6	25.1	19.3	22.8	35.8
1967	47.0	36.9	15.3	26.9	20.2	25.4	36.4
1968	50.4	39.7	17.9	30.3	21.5	27.1	33.9
1969	53.9	42.7	21.3	30.8	24.0	30.7	37.0
1970	57.6	47.4	25.4	32.4	30.3	36.8	42.8
1971	61.1	52.7	30.3	36.8	35.7	43.1	50.5
1972	64.4	57.6	40.1	44.2	43.1	52.3	58.2
1973	69.0	62.8	55.0	57.7	58.6	66.4	64.0
1974	76.3	74.4	67.1	63.3	69.0	74.0	77.4
1975	85.4	81.7	77.1	87.9	80.3	95.0	96.5
1976	92.3	96.9	82.3	91.4	84.2	89.5	92.9
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	108.3	99.5	136.1	124.2	124.7	119.1	125.6
1979	118.8	107.3	138.5	149.9	146.2	143.1	161.7
1980	132.7	118.7	143.8	172.5	160.5	165.3	215.3
1981	145.8	133.7	158.4	156.0	139.1	153.8	219.5
1982	158.2	145.7	147.0	150.6	136.3	153.5	206.9
1983	166.7	156.5	159.4	148.1	134.3	159.5	194.0
Output Per Man Hour (Productivity)							
1965	74.5	62.7	33.1	49.0	54.2	52.9	64.0
1966	75.3	64.9	36.5	52.9	56.4	56.4	66.1
1967	75.3	66.9	41.9	56.1	59.7	59.7	69.3
1968	78.0	71.5	47.1	62.0	64.0	64.5	74.3
1969	79.3	75.7	54.5	65.6	68.3	69.4	76.1
1970	79.1	76.8	61.4	69.3	70.1	72.7	77.8
1971	83.9	82.3	65.3	73.1	73.0	74.9	81.5
1972	88.2	85.9	72.7	77.5	77.8	81.1	87.5
1973	93.0	91.3	80.2	82.0	82.5	90.9	93.5
1974	90.8	93.4	82.1	85.0	86.9	95.3	95.5
1975	93.4	91.0	85.3	88.4	90.0	91.1	94.7
1976	97.5	96.2	93.3	94.9	96.1	98.9	99.5
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.8	101.4	107.9	105.9	102.5	103.0	101.3
1979	101.5	104.2	117.4	110.6	107.4	110.5	102.4
1980	101.7	102.0	128.6	112.3	108.8	116.9	101.3
1981	105.3	104.6	135.7	115.3	111.4	121.0	107.9
1982	106.5	102.0	146.8	121.7	113.3	124.1	111.2
1983	113.1	109.0	155.2	129.1	118.5	124.8	118.0

r - Revised.

(a) U.S. dollar basis.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

COST RECOVERY ALLOWABLE FOR TAX PURPOSES ON MACHINERY AND EQUIPMENT

(Percent of Original Cost)

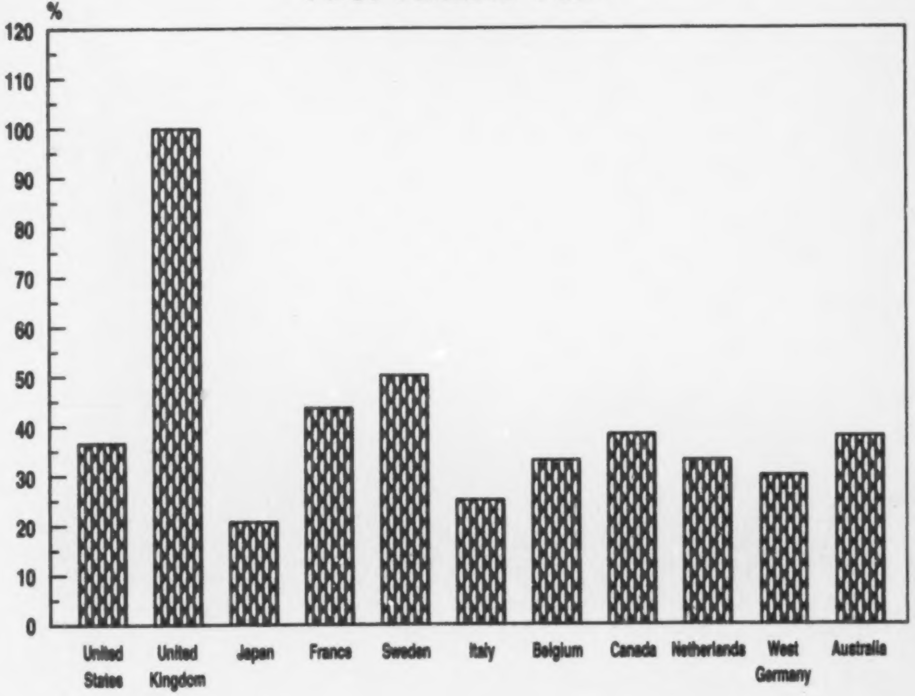
Country	First Year	Third Year	Seventh Year
U.S.	36.7	79.7	121.7
United Kingdom	100.0	100.0	100.0
Japan	20.6	50.0	80.1
France	43.8	73.4	95.8
Sweden	50.0	85.7	120.0
Italy	25.0	75.0	100.0
Belgium	33.0	61.8	102.0
Canada	38.4	108.2	108.2
Netherlands	33.1	53.1	93.1
West Germany	30.0	65.7	91.7
Australia	38.0	78.0	118.0

Note: These capital cost recovery allowances are based on statutory or other published provisions of law. As such they do not reflect informal or ad hoc arrangements that are frequently available in foreign countries - but not in the U.S. - to increase the rate of cost recovery actually allowed to industrial producers in those countries.

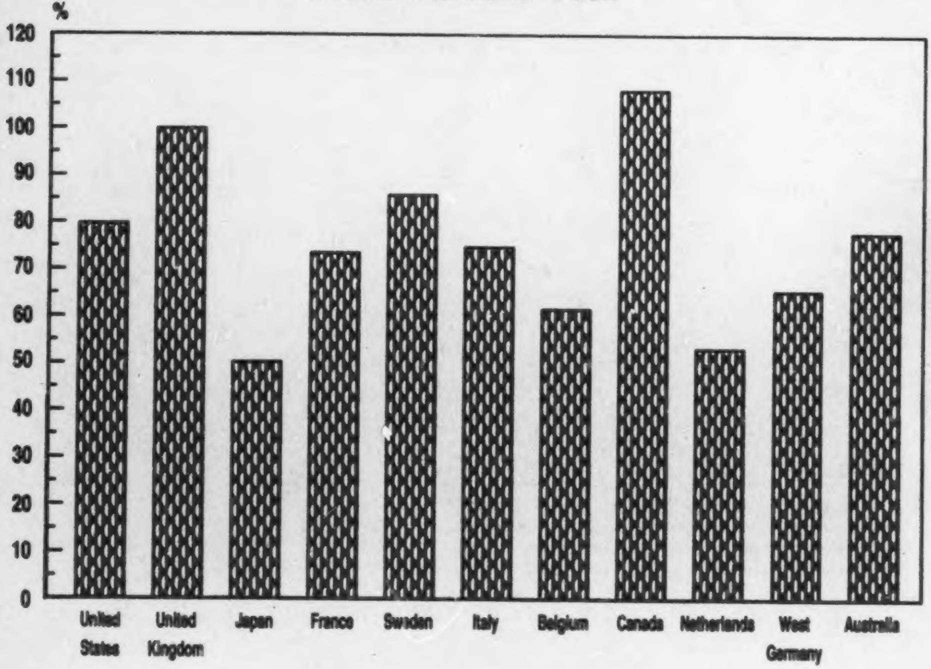
Source: Report of the President's Task Force on Business Taxation, September 1970, pages 28-29 updated by Price Waterhouse & Company. The most recent data is for the year 1983.

Cost recovery allowable for tax purposes includes depreciation as well as any tax credits. Where credits are available, total allowable cost recovery exceeds 100% of the original purchase cost. The rate of depreciation determines how quickly these costs are recovered. The percent values as stated are based on accelerated depreciation rates applicable in each country. At the end of the depreciation period, the taxable profits of the enterprise will have been reduced by the allowable cost recovery. The actual tax savings will depend on the tax rate prevailing in the specific country.

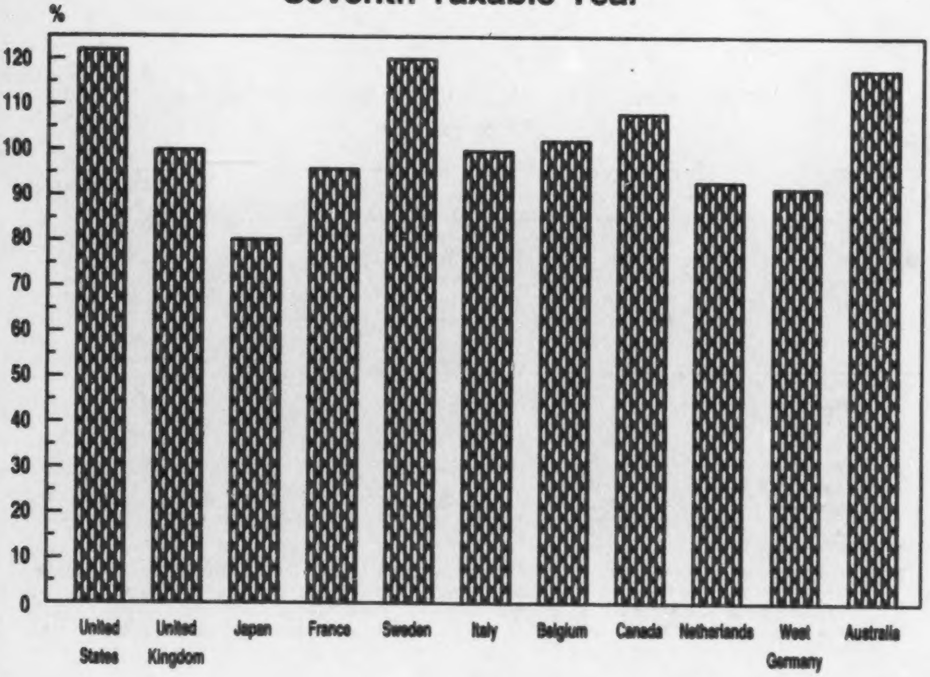
First Taxable Year



Third Taxable Year



Seventh Taxable Year



FEDERAL, STATE AND LOCAL TAX REVENUES AS PERCENT OF GNP, 1981

Selected Countries

Country	Total	Sales & Excise (a)	Social Security Total (b)	Corporate Income	Non-Corporate Income (b)	Other (d)
Belgium	44.3%	11.0%	13.7%	2.4%	15.4%	1.8%
Canada	35.8	9.5	4.1	3.7	12.1	6.3
Denmark	46.5	16.6	1.0	1.3	24.4	3.2
France	37.2	10.8	15.9	1.9	5.0	3.7
Italy	33.7	8.1	12.1	3.0	8.8	1.7
Japan	27.1	3.7	8.1	4.3	6.7	4.2
Luxembourg	33.1	6.8	9.6	5.1	9.2	2.4
Netherlands	45.3	10.1	18.1	3.2	11.2	2.8
Sweden	51.9	11.7	15.4	1.5	20.7	2.6
Switzerland	28.9	5.3	8.9	1.7	10.3	2.6
Turkey	18.9	5.3	1.0	1.9	8.7	2.0
United Kingdom	36.6	9.8	5.9	3.4	10.7	6.7
United States	29.8	4.6	7.9	2.6	11.2	3.6
West Germany	37.3	9.7	13.3	1.9	10.8	1.6

(a) Includes general sales, value added, and specific excise taxes.
(b) Includes contributions of employers, employees, and self-employed.
(c) Includes income taxes on individual and unincorporated enterprise.
(d) Includes taxes on net wealth and immovable property, taxes and stamp duties on gifts, inheritances, etc.

Source: "Revenue Statistics of OECD Member Countries, 1965-1982."

SOCIAL SECURITY TAX REVENUES AS PERCENT OF GNP, 1981

Selected Countries

Country	Total (a)	Employees	Employees	Self-Employed and Other
Belgium	13.7%	4.1%	8.4%	1.2%
Canada	4.1	1.4	2.6	0.1
Denmark	1.0	0.5	0.5	0.0
France	15.9	4.1	10.8	1.0
Italy	12.1	1.8	7.4	2.9
Japan	8.1	2.9	4.2	1.1
Luxembourg	9.6	3.8	5.3	0.5
Netherlands	18.1	7.6	8.1	2.4
Sweden	15.4	0.0	14.8	0.6
Switzerland	8.9	3.0	3.0	2.9
Turkey	1.0	0.0	0.0	1.0
United Kingdom	5.9	2.5	3.3	0.1
United States	7.9	3.1	4.6	0.2
West Germany	13.3	5.9	7.1	0.2

NA - Not Available.

(a) The category is broadly defined to include all tax payments to institutions of general government providing social welfare benefits, provided they are levied as a function of pay or as a fixed amount per person. Thus, for the United States, this category includes contributions to the railroad retirement fund, unemployment insurance fund, workmen's compensation fund, and civil service retirement program in addition, of course, to the more familiar social security payments made pursuant to the Federal Insurance Contributions Act (FICA).

Source: "Revenue Statistics of OECD Member Countries, 1965-1982."

3

U. S. MACHINE TOOL INDUSTRY

The "Machine Tool Industry" actually consists of two industries according to the government's Standard Industrial Classification system (SIC); Metal Cutting Machine Tools (SIC 3541) and Metal Forming Machine Tools (SIC 3542).

The distinction between "industries" and "products" should be clearly kept in mind to avoid confusion in studying the statistical data in this Handbook. In brief, the machine tool industry produces not only machine tools but other products. The reverse of this is also true—not all machine tools are produced by the machine tool industry—some other industries also produce machine tools.

The machine tool industry is made up of the establishments whose "primary products" are machine tools. Data on shipments by the machine tool industry covers the totality of the shipments of the establishments in the industry. This means that not only the machine tools but also "secondary products"—products that are generally produced by other industries—are covered. Such secondary products may be tooling, machine tool accessories, abrasive products, wood- or plastic-working machines, or a variety of other products.

To measure the degree to which an industry produces its primary and secondary products, the Census Bureau has developed a "primary specialization ratio" which describes the proportion of total product shipments that are "primary products." For the metal cutting industry, this specialization ratio was 87%, for 1977. This means that 87% of the products shipped by this industry were metal cutting machine tools and 13% were products other than metalcutting machine tools. For metal forming, the corresponding figures are 90% and 10%.

The Bureau of the Census reports not only "industry" totals but also "product" totals. To obtain a product total, it adds to the machine tools produced by the machine tool industry all the machine tools produced by other industries as secondary products.

In addition to the industry specialization ratio described above, the Census has developed a ratio to describe the proportion of primary products produced by the establishments classified in the industry to total shipments of such products by all manufacturing establishments. This ratio is called the "coverage ratio." In 1977, the coverage ratio in metal cutting was 92%, in metal forming 87%. This means that the metal cutting industry produced 92% of all metal cutting machine tools produced in the U.S., the metal forming industry 87% of all American metal forming machine tools.

The data in Chapter 3 deal exclusively with the machine tool INDUSTRY. Chapter 4 deals with PRODUCTS—total machine tool orders and shipments. As already indicated, industry data are based on the Standard Industrial Classification system. This system was developed to classify establishments by type of activity—it covers the entire field of economic activities. The system is structured by digits. The first two digits identify the major industry group, the third digit identifies the industry group, and the fourth digit identifies the industry. The fifth, sixth, and seventh digits are used to define product classes (fifth) and individual products (sixth and seventh). For example:

Industries	Major Group 35:	Machinery, Except Electrical
	Group 354:	Metalworking Machinery, and Equipment
	Industry 3541:	Machine Tools, Metal Cutting Types
Products	Product Class 35413:	Gear Cutting Machines
	Product 3541371:	Gear Tooth Finishing Machines

Size of the Industry

The machine tool industry is relatively small compared to other U.S. industries. Many of the larger industrial corporations have more employees and a higher value of product shipments than the entire machine tool industry. If all of the machine tool industry were combined into one firm, its sales would rank 191st on the 1983 "Fortune 500" listing of America's largest manufacturing companies. Currently, as a result of the recession, the industry's employment has fallen to around 65,000 people, a level substantially below the Spring 1980 level of over 110,000 employees.

While the most recent Census of Manufactures (1977) reports more than 1,300 establishments in SIC 3541 and SIC 3542, estimates by the NMTBA and Census Bureau indicate that approximately 40% of these plants primarily manufacture machine tool accessories, dies, tools, jigs and fixtures rather than machine tools. According to the 1977 Census, two-thirds of these establishments had fewer than 20 employees.

Location of the Industry

During the 19th century, the machine tool industry was located almost entirely in New England. Its center moved southward into the Middle Atlantic States and Pennsylvania and then west into Ohio and other parts of the Middle West as the 1800's drew to a close. Development and growth were closely related to the growth of other industries such as textile machinery, small arms, watches and clocks, ships, railroads, farm machinery, and bicycles. By 1900, Cincinnati had become the leading machine tool center, Philadelphia was second, Providence, R.I., third. In the 1920's the rapid growth of the automobile industry accounted for the rapid growth of machine tool production in Michigan and Illinois. The decline of Pennsylvania as a machine tool producer was closely related to the decline of the locomotive. Today, the leading metal cutting machine tool producing states are Ohio, Michigan, Illinois, Connecticut, New York and Wisconsin, and the leading metal forming machine tool producers are Illinois, Ohio, Michigan, New York, and Connecticut.

Sources of Industry Data

Data on the machine tool industry comes from the Census of Manufactures (which takes place every five years) and the Annual Survey of Manufactures. The Census is based on reports from individual establishments and is very detailed. However, the Census suffers from several shortcomings. It focuses primarily on large establishments, thus data on smaller establishments are less reliable. Also, the Census is published with a considerable time lag. Because 1977 was a Census year and because of the time lag in the publication of the Census data, many of the charts and tables in this chapter were previously published using preliminary Census statistics. The final Census data were published in early 1981 and all charts and tables citing the Census have been revised to reflect these final statistics.

In general, the industry finds that its own data, and those released quarterly by the government as "Current Industrial Reports" (MQ-35W), are more useful and timely. The main value of the 5-year Census lies in the broader coverage and in the fact that shipment, employment, compensation, and other data are all available for the same population. This permits the calculation of ratios otherwise not available. The Annual Survey of Manufactures is based on sample surveys and covers fewer items than the Census. It is also published with a considerable delay between the time of data collection and distribution.

THE MACHINE TOOL INDUSTRY (a)
General Statistics, 1958 to Date

Year	Establishments		Employees (Number)	Value Added by Manufacture	Cost of Materials	Value of Shipments
	Total	With 20 or More Employees		(Millions of Dollars)		
TOTAL INDUSTRY, SIC 3541 and 3542						
1958	918	378	75,366	$ 597.0	$ 347.8	$ 997.5
1959	NA	NA	75,091	737.4	403.3	1,111.5
1960	NA	NA	81,200	815.8	468.7	1,265.7
1961	NA	NA	78,108	771.8	456.4	1,241.9
1962	NA	NA	82,251	936.8	513.7	1,430.3
1963	1,167	415	83,136	960.6	547.0	1,502.2
1964	NA	NA	88,079	1,154.7	676.7	1,790.7
1965	NA	NA	96,344	1,342.6	813.5	2,107.2
1966	NA	NA	108,174	1,666.3	961.3	2,553.8
1967	1,253	506	116,400	1,828.5	1,062.3	2,841.2
1968	NA	NA	112,200	1,830.4	988.9	2,817.3
1969	NA	NA	110,600	1,894.6	1,034.7	2,834.8
1970	NA	NA	100,200	1,581.7	992.6	2,597.8
1971	NA	NA	78,400	1,183.7	751.2	2,018.8
1972	1,277	437	76,600	1,319.4	821.6	2,111.7
1973	NA	NA	86,900	1,760.6	1,134.9	2,777.3
1974	NA	NA	94,000	2,250.7	1,523.3	3,579.8
1975	NA	NA	88,800	2,258.6	1,533.5	3,834.4
1976	NA	NA	81,000	2,285.2	1,286.2	3,566.9
1977	1,345	470	83,200	2,592.9	1,493.6	3,949.7
1978	NA	NA	89,500	3,108.3	1,994.1	4,977.8
1979	NA	NA	96,100	3,837.8	2,423.9	6,052.5
1980	NA	NA	99,700	4,391.3	2,744.6	6,980.7
1981(r)	NA	NA	98,300	4,706.3	2,850.0	7,481.0
1982(p)	1,393	457	78,200	NA	2,179.4	5,894.5

NA - Not available. p - Preliminary. r - Revised

(a) The machine tool industry (Standard Industrial Classification SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures."

THE MACHINE TOOL INDUSTRY (a)
General Statistics 1958 to Date
Metal Cutting and Metal Forming

Year	Establishments Total	Establishments With 20 or More Employees	Employees (Number)	Value Added by Manufacture (Millions of Dollars)	Cost of Materials (Millions of Dollars)	Value of Shipments (Millions of Dollars)
METAL CUTTING MACHINE TOOL INDUSTRY, SIC 3541						
1958	627	231	52,864	$ 421.0	$ 217.7	$ 679.8
1963	801	269	61,058	699.3	381.6	1,050.8
1965	NA	NA	70,827	993.6	559.2	1,524.4
1966	NA	NA	73,767	1,234.2	669.4	1,826.1
1967	903	338	87,200	1,391.3	766.9	2,127.2
1968	NA	NA	84,300	1,377.1	718.9	2,099.1
1969	NA	NA	82,600	1,441.5	744.5	2,108.3
1970	NA	NA	71,300	1,112.1	664.0	1,821.7
1971	NA	NA	54,000	819.8	473.2	1,351.1
1972	894	275	52,500	901.7	536.3	1,418.1
1973	NA	NA	59,900	1,214.1	764.1	1,891.1
1974	NA	NA	65,000	1,617.0	1,017.9	2,480.5
1975	NA	NA	62,800	1,640.3	1,050.3	2,727.8
1976	NA	NA	58,100	1,664.1	852.3	2,496.2
1977	919	307	59,500	1,871.0	1,049.6	2,819.1
1978	NA	NA	64,300	2,267.0	1,417.7	3,611.8
1979	NA	NA	69,100	2,833.8	1,736.9	4,389.0
1980	NA	NA	72,800	3,349.2	2,026.1	5,227.6
1981(r)	NA	NA	74,300	3,729.8	2,187.3	5,865.3
1982(p)	941	293	58,700	NA	1,604.7	4,468.2
METAL FORMING MACHINE TOOL INDUSTRY, SIC 3542						
1958	291	147	22,502	$ 176.0	$ 130.1	$ 317.7
1963	366	148	22,078	281.3	165.4	441.4
1965	NA	NA	25,517	349.0	254.3	582.8
1966	NA	NA	26,407	432.1	311.9	727.7
1967	350	168	29,200	437.2	295.4	714.0
1968	NA	NA	27,900	453.3	270.0	716.2
1969	NA	NA	28,000	453.1	290.2	726.5
1970	NA	NA	28,900	469.6	328.6	776.1
1971	NA	NA	24,400	363.9	278.0	667.7
1972	383	162	24,100	417.7	285.3	693.6
1973	NA	NA	27,000	546.5	370.8	886.2
1974	NA	NA	29,000	633.7	505.4	1,099.3
1975	NA	NA	26,000	618.3	483.2	1,106.6
1976	NA	NA	22,900	621.1	433.9	1,070.7
1977	426	163	23,700	721.9	444.0	1,130.6
1978	NA	NA	25,200	841.3	576.4	1,366.0
1979	NA	NA	27,000	1,004.0	687.0	1,663.5
1980	NA	NA	26,900	1,042.1	718.5	1,753.1
1981	NA	NA	24,000	976.5	662.7	1,615.7
1982(p)	452	164	19,500	NA	574.7	1,426.3

NA - Not Available. p - Preliminary. r - Revised.

(a) The machine tool industry (Standard Industrial Classifications SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures."

LOCATION OF THE MACHINE TOOL INDUSTRY (c)

Establishments, Employees, Value Added, Shipments, by Region

1963 to 1982

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. TOTAL					
1963	1,167	415	83,136	$ 980	$1,502
1967	1,253	506	116,400	1,828	2,841
1972	1,277	437	76,600	1,319	2,114
1977	1,343	469	83,200	2,593	3,950
1982	1,393	457	78,200	D	5,894
NEW ENGLAND					
1963	150	52	16,934	183	273
1967	149	68	25,300	366	550
1972	140	52	2,000(a)	32(a)	48(a)
1977	155	56	D	D	D
1982(d)	147	49	800(a)	D	48(a)
MIDDLE ATLANTIC					
1963	251	68	11,618	148	212
1967	239	71	13,400	215	299
1972	218	64	10,400	175	270
1977	197	57	7,000(b)	205(b)	286(b)
1982(d)	132	46	7,100(b)	D	399(b)
EAST NORTH CENTRAL					
1963	545	239	49,415	592	926
1967	578	270	67,500	1,100	1,764
1972	620	240	45,500	793	1,308
1977	595	252	48,200	1,535	2,389
1982(d)	587	232	42,200	D	3,675
WEST NORTH CENTRAL					
1963	44	16	1,085	11	16
1967	46	22	2,600	38	57
1972	50	25	2,400	43	65
1977	52	23	D	D	D
1982(d)	24	6	1,200	D	73
SOUTH					
1963	47	12	1,068	13	19
1967	61	29	3,200	44	63
1972	82	21	1,000(a)	19(a)	30(a)
1977	40	12	975E	5(b)	7(b)
1982(d)	–	–	–	–	–
WEST					
1963	130	28	3,016	35	55
1967	180	46	4,400	67	109
1972	168	36	2,000(a)	39(a)	64(a)
1977	162	40	3,000E	65(b)	96(b)
1982(d)	134	25	2,400	D	161

D - Withheld to avoid disclosure.   E - Estimate.

(a) Includes metal forming data only, metal cutting data withheld to avoid disclosure.

(b) Includes metal cutting data only, metal forming data withheld to avoid disclosure.

(c) Due to a change of methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(d) The regional data includes states with 500 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
1963 to 1982

Region	Establishments: Total	Establishments: With 20 or More Employees	Employees (Number)	Value Added by Manufacture (Million Dollars)	Value of Shipments (Million Dollars)
U.S. TOTAL					
1963	801	269	61,058	$ 699	$1,061
1967	903	338	87,200	1,391	2,127
1972	894	275	52,500	902	1,418
1977	919	307	59,500	1,871	2,819
1982	941	293	58,700	D	4,468
NEW ENGLAND					
1963	111	39	14,853	160	238
1967	120	51	22,900	329	492
1972	109	40	D	D	D
1977	122	44	D	D	D
1982(b)	123	40	NA	D	D
MIDDLE ATLANTIC					
1963	163	40	7,106	89	120
1967	163	44	8,100	145	189
1972	145	35	6,500	115	166
1977	125	33	7,000	205	286
1982(b)	77	27	7,100	D	399
EAST NORTH CENTRAL					
1963	387	161	36,845	425	662
1967	428	191	49,900	824	1,303
1972	438	154	31,000	538	875
1977	440	179	34,600	1,105	1,717
1982(b)	428	166	31,800	D	2,831
WEST NORTH CENTRAL					
1963	24	11	547	5	8
1967	26	10	1,600	25	36
1972	29	13	1,500	27	41
1977	28	13	D	D	D
1982(b)	24	6	1,200	D	73
SOUTH					
1963	26	4	463	6	9
1967	37	15	2,200	31	41
1972	52	12	D	D	D
1977	17	2	200	5	7
1982(b)	–	–	–	–	–
WEST					
1963	90	14	1,244	15	24
1967	129	27	2,500	38	66
1972	121	21	D	D	D
1977	104	18	1,700	65	96
1982(b)	93	12	1,400	D	88

D - Withheld to avoid disclosure. NA - Not Available.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 500 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
1963 to 1982

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. Total					
1963	366	146	22,078	$281	$ 441
1967	350	168	29,200	437	714
1972	383	162	24,100	418	696
1977	426	163	23,700	722	1,131
1982	452	164	19,500	D	1,426
NEW ENGLAND					
1963	39	13	2,081	23	35
1967	29	17	2,400	37	58
1972	31	12	2,000	32	48
1977	33	12	D	D	D
1982(b)	24	9	800	D	48
MIDDLE ATLANTIC					
1963	88	28	4,512	59	92
1967	76	27	5,300	70	110
1972	73	29	3,900	60	104
1977	72	24	D	D	D
1982(b)	55	19	(C)	D	D
EAST NORTH CENTRAL					
1963	158	78	12,570	167	264
1967	150	79	17,600	276	461
1972	182	86	14,500	256	433
1977	155	73	13,600	430	672
1982(b)	159	66	10,400	D	844
WEST NORTH CENTRAL					
1963	20	5	538	6	8
1967	20	12	1,000	13	21
1972	21	12	900	16	24
1977	24	10	D	D	D
1982(b)	-	-	-	-	-
SOUTH					
1963	21	8	605	7	10
1967	24	14	1,000	13	22
1972	30	9	1,000	19	30
1977	23	10	955E	D	D
1982(b)	-	-	-	-	-
WEST					
1963	40	14	1,772	20	31
1967	51	19	1,900	29	43
1972	47	15	2,000	39	64
1977	58	22	1,300E	D	D
1982(b)	41	13	1,000	D	73

D - Withheld to avoid disclosure. E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 500 employees or more.

(c) 1,000 - 2,499 Employees.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35(C)" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1977 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	95	16	1,500	$ 60	$ 89
Connecticut	46	18	4,600	148	234
Illinois	94	39	6,500	196	291
Indiana	25	8	1,400	39	57
Iowa	6	4	500	12	21
Massachusetts	37	10	2,200	66	92
Michigan	190	74	9,100	353	566
Minnesota	20	7	1,300	40	58
New Jersey	31	6	400	10	15
New York	52	16	4,700	148	204
Ohio	95	40	13,900	389	624
Pennsylvania	42	11	1,900	48	66
Rhode Island	20	7	2,400	62	82
Texas	17	2	200	5	7
Vermont	6	4	2,800	87	117
Washington	9	2	200	5	7
Wisconsin	36	18	3,700	128	180
STATE			1982(b)		
California	93	12	1,400	NA	$ 88
Connecticut	61	17	5,100	NA	326
Illinois	90	30	5,900	NA	384
Indiana	22	4	1,300	NA	83
Massachusetts	35	11	2,600	NA	176
Michigan	203	82	8,900	NA	1,056
Minnesota	24	6	1,200	NA	73
New Hampshire	5	3	(a)	NA	D
New York	42	14	4,900	NA	275
Ohio	75	35	12,300	NA	394
Pennsylvania	35	13	2,200	NA	124
Rhode Island	16	5	(a)	NA	D
Vermont	6	4	2,600	NA	153
Wisconsin	38	15	3,400	NA	375

D - Withheld to avoid disclosure. NA - Not available.

(a) 1,000 - 2,499 Employees.
(b) Data includes only states with 500 machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1977 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	47	16	1,100	$ 37	$ 62
Colorado	8	4	400	10	17
Connecticut	24	10	1,800	50	72
Illinois	52	25	6,400	177	276
Indiana	11	7	600	18	31
Kansas	5	3	300	7	12
Michigan	58	22	2,000	68	110
Missouri	12	6	300	5	8
New York	29	11	2,200	65	96
Ohio	34	19	4,600	167	255
Pennsylvania	19	7	900	37	59
Texas	10	4	200	4	6
STATE			1982(b)		
California	41	13	1,000	NA	$ 73
Connecticut	24	9	800	NA	48
Illinois	56	25	4,400	NA	397
Michigan	56	23	1,600	NA	118
New York	31	9	1,700	NA	91
Ohio	47	18	4,400	NA	329
Pennsylvania	24	10	(a)	NA	D

D - Withheld to avoid disclosure. NA - Not Available.

(a) 1,000-2,499 Employees.
(b) Data includes only states with 500 machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

THE MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1963	1967	1972	1977	1982
Number of Companies	1,146	1,209	1,232	1,285	1,290
Number of Establishments	1,167	1,253	1,277	1,345	1,393
Number of Employees	83,136	116,400	76,600	83,100	78,200
1 to 4 Employees					
Establishments	375	336	360	434	NA
Employees	714	500	800	800	NA
5 to 9 Employees					
Establishments	191	189	212	262	NA
Employees	1,295	1,300	1,500	1,700	NA
10 to 19 Employees					
Establishments	186	222	248	178	NA
Employees	2,612	3,100	3,400	2,400	NA
20 to 49 Employees					
Establishments	182	218	194	219	NA
Employees	5,643	6,500	6,000	6,700	NA
50 to 99 Employees					
Establishments	96	111	89	98	NA
Employees	6,455	7,700	6,200	6,700	NA
100 to 249 Employees					
Establishments	67	79	83	75	NA
Employees	10,620	12,700	12,500	11,500	NA
250 to 499 Employees					
Establishments	31	43	37	41	NA
Employees	11,249	15,100	12,600	14,800	NA
500 to 999 Employees					
Establishments	22	30	24	27	NA
Employees	15,583	21,400	17,600	21,700(a)	NA
1000 to 2499 Employees					
Establishments	14	22	8	8	NA
Employees	19,236	35,500	16,200(b)	16,600(b,d)	NA
2500 Employees or More					
Establishments	3	3	2(b)	1	NA
Employees	9,729	12,400	NA	(c)	NA

NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.
(b) Includes only metal cutting to avoid disclosure.
(c) The number of employees is included in the "1000-2499 Employees" category.
(d) Also includes data for the "2500 Employees or More" (metal cutting) category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

THE METAL CUTTING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1963	1967	1972	1977	1982
Number of Companies	784	865	857	874	860
Number of Establishments	801	903	894	919	941
Number of Employees	61,058	87,200	52,500	59,400	58,700
1 to 4 Employees					
Establishments	276	256	281	315	NA
Employees	529	400	600	600	NA
5 to 9 Employees					
Establishments	127	142	158	184	NA
Employees	840	1,000	1,100	1,200	NA
10 to 19 Employees					
Establishments	129	167	180	112	NA
Employees	1,803	2,300	2,500	1,500	NA
20 to 49 Employees					
Establishments	118	145	126	144	NA
Employees	3,607	4,300	3,900	4,400	NA
50 to 99 Employees					
Establishments	56	74	55	67	NA
Employees	3,727	5,200	3,800	4,600	NA
100 to 249 Employees					
Establishments	44	49	47	40	NA
Employees	6,912	8,100	7,000	6,300	NA
250 to 499 Employees					
Establishments	22	30	24	28	NA
Employees	7,713	10,600	8,400	10,300	NA
500 to 999 Employees					
Establishments	15	20	14	19	NA
Employees	10,664	13,900	9,200	13,800	NA
1000 to 2499 Employees					
Establishments	11	17	7	7	NA
Employees	15,534	28,900	16,200(a)	16,600(a)	NA
2500 Employees or More					
Establishments	3	3	2	1	NA
Employees	9,729	12,400	D	D	NA

D - Withheld to avoid disclosure. NA - Not Available.

(a) Also includes data for the "2500 Employees or More" category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

THE METAL FORMING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1963	1967	1972	1977	1982
Number of Companies	362	344	375	411	430
Number of Establishments	366	350	383	426	452
Number of Employees	22,078	29,200	24,100	23,700	19,500
1 to 4 Employees					
Establishments	99	80	99	119	NA
Employees	185	100	200	200	NA
5 to 9 Employees					
Establishments	64	47	54	78	NA
Employees	455	300	400	500	NA
10 to 19 Employees					
Establishments	57	55	68	66	NA
Employees	809	800	900	900	NA
20 to 49 Employees					
Establishments	64	73	68	75	NA
Employees	2,036	2,200	2,100	2,300	NA
50 to 99 Employees					
Establishments	40	37	34	31	NA
Employees	2,728	2,500	2,400	2,100	NA
100 to 249 Employees					
Establishments	23	30	36	35	NA
Employees	3,708	4,600	5,500	5,200	NA
250 to 499 Employees					
Establishments	9	13	13	13	NA
Employees	3,536	4,500	4,200	4,500	NA
500 to 999 Employees					
Establishments	7	10	10	8	NA
Employees	4,919	7,500	8,400(a)	7,900(a)	NA
1000 to 2499 Employees					
Establishments	3	5	1	1	NA
Employees	3,702	6,600	D	D	NA
2500 Employees or More					
Establishments	—	—	NA	NA	NA
Employees	—	—	NA	NA	NA

D - Withheld to avoid disclosure.　NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

INVENTORIES OF THE MACHINE TOOL INDUSTRY
End of Year, Selected Years, 1967 to Date

(Millions of Dollars)

	Total Machine Tool Industry	Metal Cutting SIC 3541	Metal Forming SIC 3542
TOTAL INVENTORIES			
1967	$ 743.1	$ 535.3	$207.8
1970	820.5	562.9	257.6
1971	726.0	492.8	233.2
1972	724.9	482.2	242.7
1973	885.7	591.9	293.8
1974	1,150.0	786.2	363.8
1975	1,100.4	737.9	362.5
1976	1,048.3	735.4	312.9
1977	1,238.0	878.4	359.6
1978	1,434.0	1,012.3	421.7
1979	1,689.2	1,242.2	447.0
1980	1,874.6	1,419.4	455.2
1981(r)	1,954.1	1,474.4	479.7
Finished Products			
1967	158.9	112.1	46.8
1970	197.7	135.5	62.2
1971	186.1	123.2	62.9
1972	173.6	112.8	60.7
1973	174.7	111.0	63.7
1974	223.8	148.3	75.5
1975	244.6	166.0	78.6
1976	233.5	168.9	64.6
1977	264.7	184.2	80.5
1978	282.4	199.7	82.7
1979	312.1	222.3	89.8
1980	354.1	253.5	100.6
1981	453.9	315.9	138.0
Work in Process			
1967	442.0	329.5	112.5
1970	458.1	326.4	131.7
1971	385.5	278.3	107.2
1972	395.2	279.8	115.4
1973	521.2	371.4	149.8
1974	678.2	492.6	185.6
1975	618.1	447.7	170.4
1976	596.3	443.8	152.5
1977	717.6	537.5	180.1
1978	868.5	642.3	226.2
1979	1,042.8	812.5	230.3
1980	1,220.3	989.4	230.9
1981	1,210.0	989.1	220.9
Materials, Supplies, Fuel, Etc.			
1967	142.2	93.7	48.5
1970	164.7	101.0	63.7
1971	154.4	91.3	63.1
1972	156.2	89.6	66.6
1973	189.8	109.5	80.3
1974	248.0	145.3	102.7
1975	237.7	124.2	113.5
1976	218.4	122.7	95.7
1977	255.7	156.7	99.1
1978	283.1	170.3	112.8
1979	334.3	207.4	126.9
1980	300.0	176.4	123.6
1981	301.3	120.8	180.5

r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC77(1)-35C" and earlier issues; U.S. Bureau of the Census, "Annual Survey of Manufactures." See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
Quantity Used

Material	Unit of Measure	Metal Cutting Industry 1972	Metal Cutting Industry 1977	Metal Cutting Industry 1982	Metal Forming Industry 1972	Metal Forming Industry 1977	Metal Forming Industry 1982
MILL SHAPES							
Carbon Steel	Short Ton	85,900(i)	NA	NA	139,100(j)	113,400(a)	52,500(q)
Stainless Steel	Short Ton	900	NA	NA	500	100(m)	NA
Other Alloy Steel	Short Ton	24,500	20,000(o)	NA	9,600	12,000(n)	NA
Copper and Alloy	000 Lbs.	600(h,k)	3,800(d,h)	NA	300(k)	800(k)	NA
Aluminum and Alloy	000 Lbs.	1,400(b)	NA	NA	NA	1,100	NA
Iron and Steel Scrap	Short Ton	20,100	6,500	NA	D	NA	D
CASTINGS (Rough and Semifinished)							
Iron (Gray & Malleable)	Short Ton	69,900	77,900(p)	1,800	36,500	NA	D
Steel	Short Ton	NA	NA	NA	11,100	12,400(p)	D
Aluminum and Alloy	000 Lbs.	NA	NA	NA	700	2,600(p)	0
Copper and Alloy	000 Lbs.	1,100	1,700(p)	0	2,600	NA	0
IRON AND STEEL FORGINGS							
Iron & Steel Forgings	Short Ton	4,700	5,900(p)	0	7,500	8,200(p)	0
ELECTRIC MOTORS AND GENERATORS							
Fractional	Number	96,300(c)	1,900(l,p)	NA	900(l)	1,900(l,p)	0
Integral	Number	NA	NA	900	NA	NA	D

NA - Not Available. D - Withheld to avoid disclosure.

(a) Excludes structural shapes and all other carbon steel.
(b) Sheet and extrusion only.
(c) Excludes timing motors.
(d) Insulated wire and cable only.
(e) Excludes wire and wire products and sheet and strip.
(f) Excludes plate, sheet and strip and pipe and tube.
(g) Sheet and plate only.
(h) Bare wire only.
(i) Bars and bar shapes, sheet and strip, and plates only.
(j) Bars and bar shapes, sheet and strip, plates, and structural shapes only.
(k) Rod, bar, and mechanical wire and plate, sheet. and strip only.
(l) Timing motors only.
(m) Sheet and strip only.
(n) Excludes bars and bar shapes.
(o) Bars and bar shapes only.
(p) Purchased only.
(q) Plates only.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment." See chapter introduction.

PRODUCTS OF THE METAL CUTTING AND FORMING INDUSTRIES
Selected Years
(Values in Millions of Dollars)

Industry and Year					
Metal Cutting Industry (3541)	TOTAL SHIPMENTS	Metal Cutting Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1967	$2,127.2	$1,715.7	$269.7	$141.8	86%
1972	1,418.1	1,135.5	188.9	93.7	86
1977(r)	2,819.1	2,353.9	337.0	121.8	87
1982	4,468.2	NA	NA	NA	NA
Metal Forming Industry (3542)	TOTAL SHIPMENTS	Metal Forming Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1967	$ 714.0	$568.4	$ 99.5	$ 46.1	85%
1972	696.3	583.6	73.1	39.6	89
1977	1,130.6	967.1	111.6	51.9	90
1982	1,426.3	NA	NA	NA	NA

NA - Not Available. r - Revised.

Note: "Primary Product Specialization" is arrived at by dividing "Primary Products" by "Primary Products plus Secondary Products."

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982; Industry Series: Metalworking Machinery and Equipment MC77-1-35C" and earlier issues. See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
(Millions of Dollars)

	Metal Cutting Industry			Metal Forming Industry		
Material	1972	1977	1982	1972	1977	1982
GRAND TOTAL	$454.3	$904.4	$1,397.8	$253.4	$395.7	$511.7
MILL SHAPES						
Carbon Steel	34.4	63.1	69.7	36.7	58.3	58.0
Stainless Steel	3.2	3.0	1.6	.6	.7	.8
Other Alloy Steel	15.5	23.2	18.8	7.0	12.1	7.5
Copper and Alloy	3.5	5.5	8.2	1.1(a)	2.4	2.3
Aluminum and Alloy	1.4	1.7	3.4	0.8	2.7	1.3
Iron and Steel Scrap	0.9	1.1	2.3	D	0.7	.3
CASTINGS (Rough and Semifinished)						
Iron (Gray and Malleable)	43.6	84.5	88.0	18.1	29.4	27.0
Steel	4.4	8.7	54.6	8.9	18.8	16.6
Aluminum and Alloy	4.1	6.0	3.0	0.8	2.9	2.4
Copper and Alloy	1.2	2.5	1.2	2.9	1.5	2.9
IRON AND STEEL FORGINGS						
Iron and Steel Forgings	4.3	8.7	15.4	6.1	11.3	13.8
ELECTRICAL MOTORS AND GENERATORS						
Fractional	4.3	7.0	26.8	0.6	2.7	5.1
Integral	16.3	26.3	35.1	6.6	12.6	6.7
BEARINGS						
Ball and Roller	13.2	18.6	25.9	3.7	7.6	9.5
ALL OTHER MATERIALS						
Components, Parts, Etc.	227.0	478.6	753.9	114.7	151.7	192.7
NO BREAKDOWN FURNISHED						
Materials, Parts, Containers and Supplies	77.0	165.9	289.9	44.8	80.3	164.8

D - Withheld to avoid disclosure.

(a) Excludes bare wire, pipe and tube.

Source: U.S. Bureau of the Census "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment," and earlier issues. See chapter introduction.

4

U. S. MACHINE TOOL SHIPMENTS AND ORDERS

This chapter deals with machine tool products shipped by the machine tool industry and other industries.

Up and Down Performance

The machine tool business is highly cyclical, a fact evidenced by historical patterns of new orders, shipments and order backlogs. The dramatic ups and downs in the value of shipments and orders tend to obscure significant changes in the "product mix"; the share of the total comprised by the different major machine tool product categories.

One of the more notable of these changes is the increased share of "other machines" in metal cutting machine tool shipments. This category's share of output has risen from a 15-20% in the late 1950's and early 1960's to more than twice that level in recent years. The reason for this dramatic rise is that this group includes station type machines and multi-function NC machines (machining centers). As such, its increased market share demonstrates parallel yet divergent trends ongoing in American metalworking.

Station type machines are highly specialized, dedicated machines, designed to produce one part in volumes of up to hundreds of thousands per year. They are the model of efficiency through the use of dedicated mass production. Machining centers, on the other hand, represent efficiency through flexibility. By virtue of their tool changing capability and their numerical control - in which a part-making program maintains the production process rather than manual control - these machines can be easily reprogrammed to produce a variety of parts.

These are only two examples of how machine tool technology, and America's machine tool builders have responded to the changing metalworking needs of America's manufacturers

Data Sources

Census and Annual Survey of Manufactures

The broadest coverage of machine tool shipment data is provided by the Census of Manufactures and the Annual Surveys of Manufactures. Included in these reports are statistics for: most of the major categories of metal cutting machine tools (boring, drilling, gear cutting, presses, etc.), machine tools primarily designed for home workshops and laboratories, parts sold separately, and machine tools originating primarily from small-sized plants-not specified by kind. Broad coverage is given to both metal cutting and metal forming machine tools in these reports.

The comprehensive Census of Manufactures is taken every five years (those ending in 2 and 7) and the Annual Survey of Manufactures is published in non-Census years. The charts and tables in this chapter were updated with published revised reports from the 1977 Census of Manufactures and the 1981 Annual Survey of Manufactures.

There are two other sources of machine tool shipment data widely used by students of the industry. One is the monthly order and shipment series published by NMTBA. The other is the quarterly "Current Industrial Report, Metalworking Machinery" (MQ35W), published by the U.S. Department of Commerce. The MQ-35W provides more detailed coverage of shipments by product types than either the Census or Survey of Manufactures. Both the MQ-35W and the NMTBA estimates are more timely and are published more frequently than the Census or Annual Survey.

NMTBA Estimate of Orders and Shipments

The NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" is published monthly, normally three or four weeks after the end of the month reported. This report differs from the broader Census report in that it is limited to complete machine tools and excludes the value of: (a) machine tools costing under $2,500, (b) machine tools designed for home workshops, etc., (c) rebuilt machines and (d) parts sold separately.

Machine tool manufacturers representing more than two-thirds of total U.S. machine tool shipments participate in the NMTBA survey. The figures received each month from respondents are expanded, based on "benchmark" totals derived from the MQ-35W reports, to an estimate of the industry total by NMTBA's Statistical Department.

The MQ-35W Report

The "Current Industrial Report, Metalworking Machinery" (MQ-35W) is published quarterly, usually about three months after the end of the quarter reported, by the Bureau of the Census.

The report covers the number and value of total machine tools shipped, by 5- and 7-digit SIC categories, for more than 120 different machine tool products. It does not report new orders but does report unfilled orders.

The report is limited to information on complete new machine tools, excluding data for small machine tools designed for home use, etc., and data for rebuilt machines. It lists separately machines with a value of $2,500 and over, and those with a value under $2,500. The MQ-35W figures, excluding machine tools with an average value under $2,500, form the benchmark used for the NMTBA "Industry Estimate."

The MQ-35W report also provides data on numerically controlled machine tools and on manufacturers' exports. It is intended to cover all manufacturers of machine tool products, including those who produce machine tools for their own use but not for sale in the marketplace, and thus to cover all shipments.

SHIPMENTS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

Year	TOTAL			Metal Cutting			Metal Forming		
	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,377	$1,270	$107	$ 945	$ 858	$ 87	$ 432	$412	$ 20
1957	1,243	1,110	33	900	803	97	343	307	36
1958	591	507	4	436	381	57	153	126	27
1959	616	538	78	441	390	51	175	148	27
1960	744	580	64	541	420	121	203	160	43
1961	751	522	229	541	366	175	210	156	54
1962	821	606	215	613	450	163	208	156	52
1963	896	741	155	639	526	113	257	215	42
1964	1,164	959	05	845	679	166	319	280	39
1965	1,426	1,249	177	1,023	886	137	403	363	40
1966	1,685	1,535	150	1,222	1,098	124	463	437	26
1967	1,806	1,618	188	1,353	1,211	142	453	407	46
1968	1,727	1,563	164	1,358	1,238	120	369	325	44
1969	1,597	1,446	151	1,192	1,077	115	405	369	36
1970	1,443	1,239	204	993	827	166	450	412	38
1971	998	840	156	672	554	118	326	286	40
1972	1,019	894	124	714	627	87	304	267	37
1973	1,501	1,323	178	1,074	935	139	427	388	39
1974	2,031	1,763	267	1,445	1,241	205	585	522	63
1975	2,452	2,033	419	1,879	1,548	331	573	484	89
1976	2,060	1,744	316	1,482	1,270	212	578	474	104
1977	2,281	2,030	251	1,651	1,470	181	630	560	70
1978	3,013	2,689	325	2,189	1,960	228	825	729	96
1979	3,877	3,465	411	2,930	2,605	325	947	860	87
1980	4,692	4,084	608	3,681	3,206	475	1,011	878	133
1981	5,096	4,377	719	4,105	3,553	552	991	824	167
1982	3,604	3,198	406	2,895	2,599	296	710	600	110
1983	1,845	1,630	215	1,372	1,200	172	474	430	43

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

Year	TOTAL			Metal Cutting			Metal Forming		
	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,298	$1,172	$126	$ 983	$ 882	$101	$ 315	$290	$25
1957	722	644	78	552	491	61	170	153	17
1958	427	350	77	299	247	52	128	103	25
1959	748	644	104	541	471	70	207	173	34
1960	744	527	217	535	375	160	209	152	57
1961	772	536	236	591	401	190	181	135	46
1962	815	661	154	571	468	103	244	193	51
1963	1,061	869	192	760	607	153	301	262	39
1964	1,577	1,348	229	1,038	861	177	539	487	52
1965	1,692	1,532	160	1,251	1,122	129	441	410	31
1966	2,074	1,884	190	1,629	1,483	146	445	401	44
1967	1,420	1,272	148	1,134	1,024	110	286	248	38
1968	1,474	1,320	154	1,080	960	120	394	360	34
1969	1,728	1,517	211	1,195	1,033	162	533	484	49
1970	912	733	179	651	507	144	261	226	35
1971	861	747	114	609	524	85	252	223	29
1972	1,412	1,245	167	1,009	877	132	403	368	35
1973	2,613	2,268	345	1,825	1,550	275	787	717	70
1974	2,583	2,185	398	2,017	1,716	301	566	4/0	96
1975	1,277	1,064	213	916	1781	135	361	284	77
1976	2,203	1,961	242	1,662	1,477	185	541	485	56
1977	2,995	2,709	286	2,202	1,981	221	793	729	64
1978	4,349	3,944	405	3,375	3,043	332	973	901	72
1979	5,621	4,856	765	4,495	3,866	629	1,126	991	135
1980	4,754	4,239	515	3,885	3,496	389	870	744	126
1981	2,945	2,563	382	2,228	1,946	282	717	617	100
1982	1,498	1,261	236	1,064	890	175	433	372	62
1983	1,696	1,558	138	1,152	1,069	82	545	489	56

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Metal Cutting and Metal Forming Machine Tools, 1958 to Date

(Millions of Dollars)

Year	TOTAL			Metal Cutting			Metal Forming		
	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1958	$ 451	$ 24	$ 427	$ 317	$ 18	$ 299	$ 134	$ 6	$ 128
1959	769	21	748	559	18	541	210	3	207
1960	790	46	744	571	36	535	219	10	209
1961	808	36	772	621	30	591	187	6	181
1962	852	37	815	603	32	571	249	5	244
1963	1,099	38	1,061	790	30	760	309	8	301
1964	1,652	75	11,577	1,084	46	1,038	568	29	539
1965	1,771	79	1,692	1,312	61	1,251	459	18	441
1966	2,217	143	2,074	1,737	108	1,629	480	35	445
1967	1,614	194	1,420	1,292	158	1,134	322	36	286
1968	1,631	157	1,474	1,216	136	1,080	415	21	394
1969	1,910	182	1,728	1,332	137	1,195	578	45	533
1970	1,060	148	912	757	106	651	303	42	261
1971	933	72	861	655	46	609	278	25	252
1972	1,465	53	1,412	1,051	42	1,009	414	11	403
1973	2,773	160	2,613	1,958	132	1,825	815	28	787
1974	2,970	387	2,583	2,283	266	2,017	687	121	566
1975	1,651	374	1,277	1,198	282	916	453	92	361
1976	2,370	167	2,203	1,793	131	1,662	578	37	541
1977	3,153	158	2,995	2,329	127	2,202	824	31	793
1978	4,573	224	4,349	3,559	184	3,375	1,013	40	973
1979	6,063	442	5,621	4,873	378	4,495	1,190	64	1,126
1980	5,381	627	4,754	4,436	551	3,885	946	76	870
1981	3,585	640	2,945	2,799	571	2,228	786	69	717
1982	1,934	437	1,498	1,467	402	1,064	468	34	433
1983	1,890	194	1,696	1,328	177	1,152	561	17	545

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

UNFILLED ORDERS

Metal Cutting and Metal Forming Machine Tools, 1956 to Date

(Millions of Dollars)

As of December 31	Total	Metal Cutting	Metal Forming	As of December 31	Total	Metal Cutting	Metal Forming
1956	$ 990	$ 735	$255	1970	$ 706	$ 471	$235
1957	471	388	83	1971	569	408	162
1958	308	249	59	1972	963	702	261
1959	443	350	93	1973	2,074	1,454	621
1960	444	344	100	1974	2,625	2,025	600
1961	467	394	73	1975	1,450	1,062	388
1962	463	354	109	1976	1,594	1,243	351
1963	628	475	153	1977	2,306	1,794	515
1964	1,043	669	374	1978	3,643	2,981	663
1965	1,311	899	412	1979	5,388	4,546	843
1966	1,701	1,307	394	1980	5,451	4,750	701
1967	1,317	1,089	228	1981	3,300	2,873	427
1968	1,064	810	295	1982	1,194	1,043	151
1969	1,195	812	424	1983	1,045	823	222

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL CUTTING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$1,052	$ 69	$ 983	$ 946	$ 64	$ 882	$106	$ 5	$101
1957	618	66	552	555	64	491	63	2	61
1958	317	18	299	265	18	247	52	0	52
1959	559	18	541	486	15	471	73	3	70
1960	571	36	535	408	33	375	163	3	160
1961	621	30	591	425	24	401	196	6	190
1962	603	32	571	494	26	468	109	6	103
1963	790	30	760	632	25	607	158	5	153
1964	1,084	46	1,038	896	35	861	188	11	177
1965	1,312	61	1,251	1,175	53	1,122	137	8	129
1966	1,737	108	1,629	1,580	97	1,483	157	11	146
1967	1,292	158	1,134	1,173	149	1,024	119	9	110
1968	1,216	136	1,080	1,091	131	960	125	5	120
1969	1,332	137	1,195	1,160	127	1,033	172	10	162
1970	757	106	651	605	99	506	152	7	145
1971	655	46	609	565	41	524	90	5	85
1972	1,051	42	1,009	916	39	877	135	3	132
1973	1,953	132	1,825	1,675	124	1,550	283	8	275
1974	2,283	266	2,017	1,959	243	1,716	324	23	301
1975	1,198	282	916	1,027	247	780	171	35	136
1976	1,793	131	1,662	1,594	117	1,477	199	14	185
1977	2,329	127	2,202	2,095	114	1,981	234	13	221
1978	3,559	184	3,375	3,203	160	3,043	356	24	332
1979	4,873	378	4,495	4,202	337	3,866	671	42	629
1980	4,436	551	3,885	3,986	490	3,496	450	61	389
1981	2,799	571	2,228	2,476	530	1,946	323	41	282
1982	1,467	402	1,064	1,262	373	890	204	30	175
1983	1,328	177	1,152	1,236	167	1,069	92	10	82

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL FORMING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

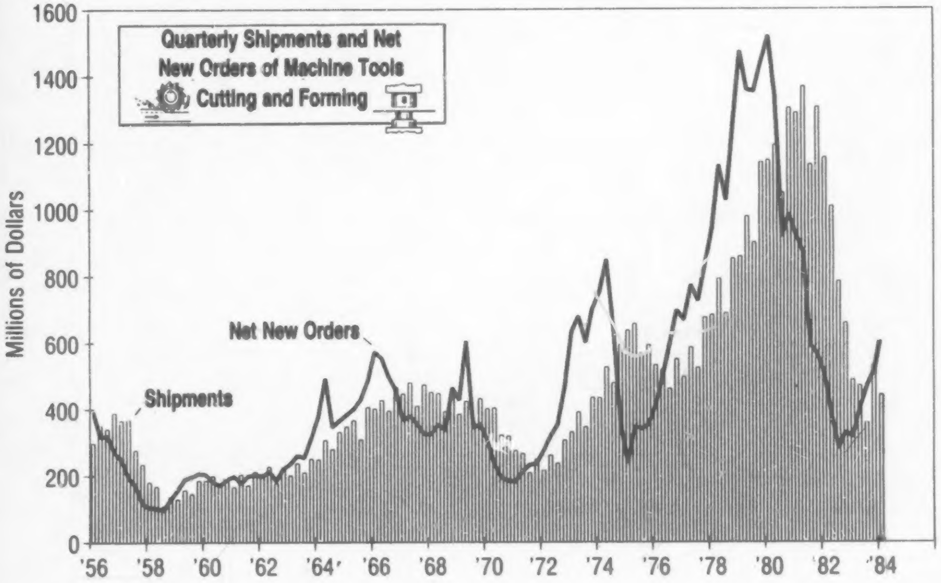
Year	TOTAL Gross New Orders	TOTAL Cancellations	TOTAL Net New Orders	Domestic Gross New Orders	Domestic Cancellations	Domestic Net New Orders	Foreign Gross New Orders	Foreign Cancellations	Foreign Net New Orders
1956	$ 340	$25	$ 315	$ 314	$24	$290	$ 26	$ 1	$ 25
1957	181	11	170	164	11	153	17	0	17
1958	134	6	128	108	5	103	26	1	25
1959	210	3	207	175	2	173	35	1	34
1960	219	10	209	161	9	152	58	1	57
1961	187	6	181	139	4	135	48	2	46
1962	249	5	244	197	4	193	52	1	51
1963	309	8	301	269	7	262	40	1	39
1964	568	29	539	511	24	487	57	5	52
1965	459	18	441	427	17	410	32	1	31
1966	480	35	445	434	33	401	46	2	44
1967	322	36	286	281	33	248	41	3	38
1968	415	21	394	380	20	360	35	1	34
1969	578	45	533	527	43	484	51	2	49
1970	303	42	261	265	38	227	38	4	34
1971	278	25	252	244	21	223	34	4	29
1972	414	11	403	378	10	368	36	1	35
1973	815	28	787	742	25	717	73	3	70
1974	687	121	566	583	113	470	105	8	96
1975	453	92	361	364	81	284	89	12	77
1976	578	37	541	513	28	485	64	8	56
1977	824	31	793	757	29	729	67	2	64
1978	1,013	40	973	938	37	901	75	3	72
1979	1,190	64	1,126	1,048	57	991	142	7	136
1980	946	76	870	814	70	744	132	6	126
1981	786	69	717	680	63	617	106	6	100
1982	468	34	433	399	28	372	68	7	62
1983	561	17	545	503	14	489	58	2	56

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

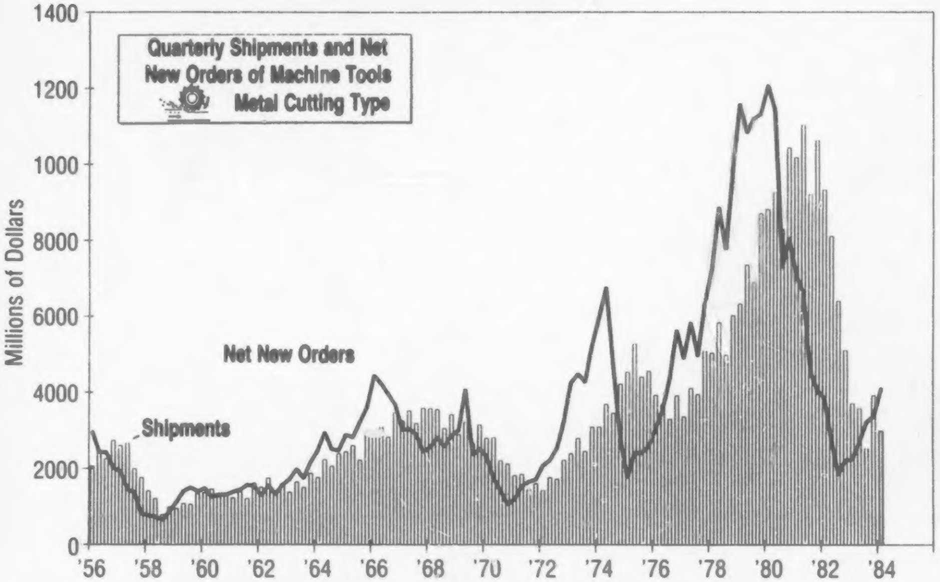
Total Machine Tool Shipments (Bar) and Net New Orders (Line)

Quarterly, 1956:1 to 1984:1



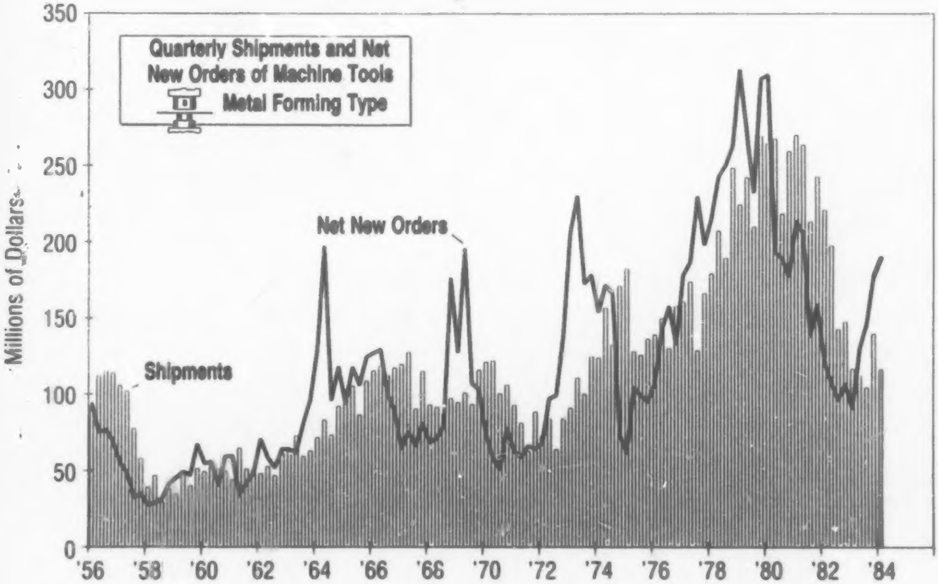
Metal Cutting Machine Tool Shipments (Bar) and Net New Orders (Line)

Quarterly, 1956:1 to 1984:1



Metal Forming Machine Tool Shipments (Bar) and Net New Orders (Line)

Quarterly, 1956:1 to 1984:1



SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1956-1962
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 274,100	$ 23,750	$187,700	$ 18,550	$ 86,400	$ 5,200
2	326,100	25,600	218,700	21,150	107,400	4,450
3	319,200	21,100	208,100	17,350	111,100	3,750
4	350,900	36,550	243,700	29,950	107,200	6,600
Total	$1,270,300	$107,000	$858,200	$ 87,000	$412,100	$20,000
1957-1 qtr.	$ 331,900	$ 33,350	$232,950	$ 26,650	$ 98,950	$ 6,700
2	325,700	41,900	236,150	29,650	89,550	12,250
3	248,050	28,350	179,300	19,800	68,750	8,550
4	204,700	28,750	155,150	20,500	49,550	8,250
Total	$1,110,350	$132,350	$803,550	$ 96,600	$306,800	$35,750
1958-1 qtr.	$ 160,050	$ 19,900	$125,500	$ 15,400	$ 34,550	$ 4,500
2	141,800	25,700	105,050	15,750	36,750	9,950
3	90,300	17,450	65,400	13,050	24,900	4,400
4	115,000	21,000	85,150	13,100	29,850	7,900
Total	$ 507,150	$ 84,050	$ 381,100	$ 57,300	$126,050	$26,750
1959-1 qtr.	$ 108,200	$ 20,750	$ 79,300	$ 14,900	$ 28,900	$ 5,850
2	137,450	19,550	95,450	12,050	42,000	7,500
3	130,650	14,400	95,050	10,000	35,600	4,400
4	162,000	23,000	120,050	13,800	41,950	9,200
Total	$ 538,300	$ 77,700	$389,850	$ 50,750	$148,450	$26,950
1960-1 qtr.	$ 159,550	$ 25,950	$117,700	$ 18,700	$ 41,850	$ 7,250
2	160,400	38,500	116,950	28,750	43,450	9,750
3	136,950	38,650	96,350	28,450	40,600	10,200
4	123,950	60,050	89,750	44,850	34,200	15,200
Total	$ 580,850	$163,150	$420,750	$120,750	$160,100	$42,400
1961-1 qtr.	$ 116,150	$ 50,100	$ 83,650	$ 38,550	$ 32,500	$11,550
2	146,450	56,650	95,900	42,550	50,550	14,100
3	117,200	53,750	80,250	39,800	36,950	13,950
4	142,850	67,750	106,750	53,800	36,100	13,950
Total	$ 522,650	$228,250	$366,550	$174,700	$156,100	$53,550
1962-1 qtr.	$ 140,250	$ 57,700	$106,100	$ 43,900	$ 34,150	$13,800
2	159,750	66,950	121,150	53,050	38,600	13,900
3	136,200	41,250	98,400	32,400	37,800	8,850
4	169,850	49,300	124,400	33,450	45,450	15,850
Total	$ 606,050	$215,200	$450,050	$162,800	$156,000	$52,400

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1963-1969
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963-1 qtr.	$ 163,100	$ 36,850	$ 112,600	$ 24,650	$ 50,500	$12,200
2	203,300	33,500	140,550	23,600	62,750	9,900
3	173,000	36,150	122,450	27,450	50,550	8,700
4	201,850	48,000	51,400	36,700	51,400	11,300
Total	$ 741,250	$154,500	$ 526,050	$112,400	$215,200	$42,100
1964-1 qtr.	$ 197,250	$ 50,700	$ 135,900	$ 40,550	$ 61,350	$10,150
2	259,800	46,700	183,550	39,850	76,250	16,850
3	231,200	47,950	170,400	35,700	60,800	12,250
4	271,500	59,250	189,300	49,400	82,200	9,850
Total	$ 959,750	$204,600	$ 679,150	$165,500	$280,600	$39,100
1965-1 qtr.	$ 304,100	$ 42,600	$ 209,850	$ 34,150	$ 94,250	$ 8,450
2	319,850	45,700	225,200	35,100	94,650	10,600
3	271,300	36,700	193,700	27,850	77,600	8,850
4	353,550	51,800	257,100	39,600	96,450	12,200
Total	$1,248,800	$176,800	$ 885,850	$136,700	$362,950	$40,100
1966-1 qtr.	$ 361,650	$ 39,000	$ 253,900	$ 31,350	$107,750	$ 7,650
2	389,700	36,150	277,200	30,150	112,500	6,000
3	361,950	32,300	256,800	25,150	105,150	7,150
4	421,050	43,400	309,600	37,600	111,450	5,800
Total	$1,534,350	$150,850	$1,097,500	$124,250	$436,850	$26,600
1967-1 qtr.	$ 399,500	$ 41,050	$ 289,750	$ 35,900	$109,750	$10,000
2	428,850	50,750	315,450	36,250	113,400	14,050
3	367,350	45,900	287,200	30,800	80,150	10,250
4	422,250	50,300	318,650	39,200	103,600	11,550
Total	$1,617,950	$188,000	$1,211,050	$142,150	$406,900	$45,850
1968-1 qtr.	402,200	$ 48,250	$ 321,500	$ 36,000	$ 80,700	$12,250
2	392,800	53,550	313,850	40,950	78,950	12,600
3	361,750	29,550	282,900	21,650	78,850	7,900
4	406,000	32,800	320,050	21,400	85,950	11,400
Total	$1,562,750	$164,150	$1,238,300	$120,000	$324,450	$44,150
1969-1 qtr.	$ 353,500	$ 30,600	$ 268,100	$ 21,350	$ 85,400	$ 9,250
2	384,300	38,450	293,250	28,500	91,050	9,950
3	321,950	37,800	234,850	31,450	87,100	6,350
4	387,000	43,950	281,250	33,700	105,750	10,250
Total	$1,446,750	$150,800	$1,077,450	$115,000	$369,300	$35,800

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1970-1976
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970-1 qtr.	$ 351,950	$ 48,700	$ 241,500	$ 37,900	$110,450	$ 10,800
2	348,000	54,800	236,200	44,550	111,800	10,250
3	269,350	51,600	176,050	44,350	93,300	7,250
4	269,650	49,000	173,600	38,750	96,050	10,250
Total	$1,238,950	$204,100	$ 827,350	$165,550	$411,600	$ 38,550
1971-1 qtr.	$ 228,500	$ 46,300	$ 142,900	$ 39,000	$ 85,600	$ 7,300
2	228,350	37,900	154,200	30,850	74,150	7,050
3	173,000	35,100	120,300	24,800	52,700	10,300
4	209,950	38,800	136,800	23,450	73,150	15,350
Total	$ 839,800	$158,100	$ 554,200	$118,100	$285,600	$ 40,000
1972-1 qtr.	$ 183,750	$ 31,550	$ 121,900	$ 20,850	$ 61,850	$ 10,700
2	229,550	31,050	155,650	21,100	73,900	9,950
3	209,300	27,050	151,300	21,200	58,000	5,850
4	271,750	34,700	198,300	24,150	73,450	10,550
Total	$ 894,350	$124,350	$ 627,150	$ 87,300	$267,200	$ 37,050
1973-1 qtr.	$ 295,050	$ 35,500	$ 209,950	$ 29,400	$ 85,100	$ 6,100
2	347,500	43,200	243,750	36,050	103,750	7,150
3	296,650	48,950	207,450	37,850	89,200	11,100
4	383,900	50,250	273,900	35,400	110,000	14,850
Total	$1,323,100	$177,900	$ 935,050	$138,700	$388,050	$ 39,200
1974-1 qtr.	$ 378,550	$ 54,750	$ 269,850	$ 39,400	$108,700	$ 15,350
2	464,250	61,350	323,800	44,850	140,450	16,500
3	408,800	69,350	291,000	54,700	117,800	14,650
4	511,550	81,950	356,700	65,550	154,850	16,400
Total	$1,763,150	$267,400	$1,241,350	$204,500	$521,800	$ 62,900
1975-1 qtr.	$ 526,550	$109,700	$ 375,400	$ 78,400	$151,150	$ 31,300
2	554,750	101,400	443,450	84,550	111,300	16,850
3	467,150	99,650	361,850	79,050	105,300	20,600
4	484,150	108,350	367,400	88,550	116,750	19,800
Total	$2,032,600	$419,100	$1,548,100	$330,550	$484,500	$88,550
1976-1 qtr.	$ 446,550	$ 85,300	$ 334,150	$ 58,500	$112,400	$ 26,800
2	425,400	92,450	302,100	65,750	123,300	26,700
3	393,450	66,900	284,850	45,100	108,600	21,800
4	477,950	71,650	348,750	42,900	129,200	28,750
Total	$1,743,350	$316,300	$1,269,850	$212,250	$473,500	$1[illegible],050

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1977 to Date

(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977-1 qtr.	$ 433,800	$ 63,100	$ 297,550	$ 38,550	$136,250	$24,550
2	526,300	58,400	365,650	45,150	160,650	13,250
3	476,000	48,050	359,300	35,850	116,700	12,200
4	594,100	81,000	447,350	61,400	146,750	19,600
Total	$2,030,200	$250,550	$1,469,850	$180,950	$560,350	$69,600
1978-1 qtr.	$ 620,900	$ 62,300	$ 459,650	$ 44,200	$161,250	$18,100
2	712,550	79,050	526,950	57,250	185,600	21,800
3	609,800	77,750	438,850	59,200	170,950	18,550
4	745,350	105,750	534,650	67,750	210,700	38,000
Total	$2,688,600	$324,850	$1,960,100	$228,400	$728,500	$96,450
1979-1 qtr.	$ 769,750	$ 88,300	$ 564,450	$ 69,000	$205,300	$19,300
2	869,050	109,150	648,100	87,650	220,950	21,500
3	802,800	97,050	611,350	78,500	191,450	18,550
4	1,023,700	116,750	781,600	89,400	242,100	27,350
Total	$3,465,300	$411,250	$2,605,500	$324,550	$859,800	$86,700
1980-1 qtr.	$1,030,450	$115,700	$ 794,650	$ 86,750	$235,800	$28,950
2	1,037,750	155,550	802,500	122,850	235,250	32,700
3	915,200	133,850	727,800	102,650	187,400	31,200
4	1,100,850	202,400	881,050	162,550	219,800	39,850
Total	$4,084,250	$607,500	$3,206,000	$474,800	$878,250	$132,700
1981-1 qtr.	$1,077,400	$210,800	$ 862,250	$155,600	$215,150	$55,200
2	1,131,150	236,350	917,950	185,450	213,200	50,900
3	1,006,000	127,950	820,350	99,950	185,650	28,000
4	1,162,100	143,850	951,900	111,050	210,200	32,800
Total	$4,376,650	$718,950	$3,552,450	$552,050	$824,200	$166,900
1982-1 qtr.	$1,041,550	$112,650	$ 861,300	$ 71,750	$180,250	$40,900
2	911,850	96,600	735,300	75,350	176,550	21,250
3	676,200	107,200	550,700	89,750	125,500	17,450
4	568,750	89,600	451,300	59,300	117,450	30,300
Total	$3,198,350	$406,050	$2,598,600	$296,150	$599,750	$109,900
1983-1 qtr.	$ 430,800	$ 56,650	$ 329,800	$ 40,800	$101,000	$15,850
2	411,350	58,300	308,200	49,300	103,150	9,000
3	314,150	42,900	220,150	32,200	94,000	10,700
4	473,750	57,150	341,450	49,600	132,300	7,550
Total	$1,630,050	$215,000	$1,199,600	$171,900	$430,450	$43,100

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipment and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1956-1962
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 353,700	$ 39,050	$ 265,200	$ 33,200	$ 88,500	$ 5,850
2	291,700	26,300	222.550	20,300	69,150	6,000
3	284,150	34,800	215,400	27,150	68,750	7,650
4	242,700	26,450	179,050	20,650	63,650	5,800
Total	$ 1,172,250	$ 126,600	$ 882,200	$ 101,300	$ 290,050	$ 25,300
1957-1 qtr.	$ 221,300	$ 25,500	$ 168,850	$ 22,950	$ 52,450	$ 2,550
2	176,600	16,300	131,650	12,900	44,950	3,400
3	152,450	17,300	123,450	13,700	29,000	3,600
4	95,150	19,150	68,000	11,650	27,150	7,500
Total	$ 645,500	$ 78,250	$ 491,950	$ 61,200	$ 153,550	$ 17,050
1958-1 qtr.	$ 86,000	$ 17,600	$ 61,750	$ 14,400	$ 24,250	$ 3,200
2	78,300	22,650	57,050	15,150	21,250	7,500
3	79,800	15,950	55,450	8,700	24,350	7,250
4	107,200	21,250	73,700	13,300	33,500	7,950
Total	$ 351,300	$ 77,450	$ 247,950	$ 51,550	$ 103,350	$ 25,900
1959-1 qtr.	$ 139,100	$ 18,300	$ 97,900	$ 14,150	$ 41,200	$ 4,150
2	172,700	16,800	127,550	12,800	45.150	4,000
3	168,300	28,500	132,350	17,450	35,950	11,050
4	164,350	42,200	113,150	26,450	51,200	15,750
Total	$ 644,450	$ 105,800	$ 470,950	$ 70,850	$ 173,500	$ 34,950
1960-1 qtr.	$ 158,500	$ 44,750	$ 112,850	$ 35,700	$ 45,650	$ 9,050
2	124,250	55,900	85,600	39,100	38,650	16,800
3	114,950	56,550	90,200	41,150	24,750	15,400
4	129,950	60,100	86,350	44,350	43,600	15,750
Total	$ 527,650	$ 217,300	$ 375,000	$ 160,300	$ 152,650	$ 57,000
1961-1 qtr.	$ 140,550	$ 57,000	$ 95,150	$ 43,250	$ 45,400	$ 13,750
2	124,150	53,000	100,050	43,750	24,100	9,250
3	128,100	70,250	97,450	59,050	30,650	11,200
4	143,950	57,550	108,500	44,600	35,450	12,950
Total	$ 536,750	$ 237,800	$ 401,150	$ 190,650	$ 135,600	$ 47,150
1962-1 qtr.	$ 156,600	$ 42,300	$ 102,200	$ 26,200	$ 54,400	$ 16,100
2	167,400	45,300	123,850	30,850	43,550	14,450
3	147,950	36,400	108,850	23,550	39,100	12,850
4	190,100	30,550	133,950	22,650	56,150	7,900
Total	$ 662,050	$ 154,550	$ 468,850	$ 103,250	$ 193,200	$ 51,300

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1963-1969
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963-1 qtr.	$ 196,150	$ 39,000	$ 140,250	$ 31,100	$ 55,900	$ 7,900
2	197,300	62,150	148,300	49,450	49,000	12,700
3	208,750	45,700	140,350	33,850	68,400	11,850
4	267,450	45,100	177,950	38,500	89,500	6,600
Total	$ 869,650	$ 191,950	$ 606,850	$ 152,900	$ 262,800	$ 39,050
1964-1 qtr.	$ 312,150	$ 64.000	$ 194,200	$ 52,900	$ 117,950	$ 11,100
2	428,100	63,200	248,150	46,300	179,950	16,900
3	293,750	52,850	209,900	40,700	83,850	12,150
4	314,050	50,800	209,000	38,000	105,050	12,800
Total	$ 1,348,050	$ 230,850	$ 861,250	$ 177,900	$ 486,800	$ 52,950
1965-1 qtr.	$ 338,850	$ 43,150	$ 253,000	$ 35,500	$ 85,850	$ 7,650
2	365,650	33,400	255,400	26,050	110,250	7,350
3	385,050	42,800	284,500	37,250	100,550	5,550
4	443,400	41,100	329,750	30,250	113,650	10,850
Total	$ 1,532,950	$ 160,450	$ 1,122,650	$ 129,050	$ 410,300	$ 31,400
1966-1 qtr.	$ 514,200	$ 57,450	$ 398,150	$ 46,450	$ 116,050	$ 11,000
2	497,800	54,350	384,400	38,500	113,400	15,850
3	457,650	38,100	364,950	30,550	92,700	7,550
4	414,800	41,300	335,600	31,300	79,200	10,000
Total	$ 1,884,450	$ 191,200	$ 1,483,100	$ 146,800	$ 401,350	$ 44,400
1967-1 qtr.	$ 327,800	$ 37,150	$ 268,600	$ 32,350	$ 59,200	$ 4,800
2	335,600	42,500	273,550	29,100	62,050	13,400
3	319,200	35,350	262,950	25,350	56,250	10,000
4	290,200	33,800	219,550	23,500	70,650	10,300
Total	$ 1,272,800	$ 148,800	$ 1,024,650	$ 110,300	$ 248,150	$ 38,500
1968-1 qtr.	$ 287,050	$ 36,800	$ 223,700	$ 31,750	$ 63,350	$ 5,050
2	307,300	44,850	246,400	34,750	60,900	10,100
3	303,800	31,900	232,200	24,250	71,600	7,650
4	422,300	40,100	257,600	28,700	164,700	11,400
Total	$ 1,320,450	$ 153,650	$ 959,900	$ 119,450	$ 360,550	$ 34,200
1969-1 qtr.	$ 376,550	$ 51,450	$ 260,000	$ 40,250	$ 116,550	$ 11,200
2	557,850	46,000	372,550	35,700	185,300	10,300
3	279,300	63,700	184,950	51,100	94,350	12,600
4	303,300	50,600	215,150	35,600	88,150	15,000
Total	$ 1,517,000	$ 211,750	$ 1,032,650	$ 162,650	$ 484,350	$ 49,100

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1970-1976
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970-1 qtr.	$ 256,650	$ 48,750	$ 191,300	$ 39,750	$ 65,350	$ 9,000
2	185,550	46,100	131,950	41,850	53,600	4,250
3	150,400	41,750	106,900	34,150	43,500	7,600
4	140,750	42,600	76,600	28,800	64,150	13,800
Total	$ 733,350	$ 179,200	$ 506,750	$ 144,550	$ 226,600	$ 34,650
1971-1 qtr.	$ 151,000	$ 30,550	$ 95,500	$ 23,250	$ 55,500	$ 7,300
2	182,250	30,150	128,800	24,550	53,450	5,600
3	204,100	27,450	144,500	20,900	59,600	6,550
4	209,950	25,700	155,300	15,950	54,650	9,750
Total	$ 747,300	$ 113,850	$ 524,100	$ 84,650	$ 223,200	$ 29,200
1972-1 qtr.	$ 242,050	$ 33,550	$ 180,550	$ 27,100	$ 61,500	$ 6,450
2	284,750	34,900	193,800	28,350	90,950	6,550
3	301,550	51,550	210,900	42,800	90,650	8,750
4	417,100	46,550	292,000	33,450	125,100	13,100
Total	$ 1,245,450	$ 166,550	$ 877,250	$ 131,700	$ 368,200	$ 34,850
1973-1 qtr.	$ 558,150	$ 73,850	$ 370,150	$ 55,850	$ 188,000	$ 18,000
2	610,550	67,550	395,450	52,550	215,100	15,000
3	512,850	87,250	358,450	68,900	154,400	18,350
4	586,050	116,400	426,350	97,750	159,700	18,650
Total	$ 2,267,600	$ 345,050	$ 1,550,400	$ 275,050	$ 717,200	$ 70,000
1974-1 qtr.	$ 644,500	$ 107,700	$ 509,750	$ 88,100	$ 134,750	$ 19,600
2	737,950	109,900	592,550	83,650	145,400	26,250
3	536,300	95,200	394,100	70,900	142,200	24,300
4	266,500	85,000	219,250	58,750	47,250	26,250
Total	$ 2,185,250	$ 397,800	$ 1,715,650	$ 301,400	$ 469,600	$ 96,400
1975-1 qtr.	$ 188,350	$ 49,250	$ 147,700	$ 28,550	$ 40,650	$ 20,700
2	276,800	68,950	201,050	39,800	75,750	29,150
3	293,750	46,700	209,600	31,750	84,150	14,950
4	305,150	47,800	222,150	35,300	83,000	12,500
Total	$ 1,064,050	$ 212,700	$ 780,500	$ 135,400	$ 283,550	$ 77,300
1976-1 qtr.	$ 354,500	$ 58,800	$ 259,950	$ 45,800	$ 94,550	$ 13,000
2	452,700	43,900	322,700	31,350	130,000	12,550
3	527,800	69,500	383,500	55,900	144,300	13,600
4	626,450	69,550	510,450	52,500	116,000	17,050
Total	$ 1,961,450	$ 241,750	$ 1,476,600	$ 185,550	$ 484,850	$ 56,200

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1977 to Date
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977-1 qtr.	$ 603,900	$ 63,550	$ 443,850	$ 45,150	$ 160,050	$ 18,400
2	692,250	78,300	522,600	61,100	169,650	17,200
3	650,700	75,150	435,300	60,900	215,400	14,250
4	762,800	68,700	578,950	54,200	183,850	14,500
Total	$ 2,709,650	$ 285,700	$1,980,700	$ 221,350	$ 728,950	$ 64,350
1978-1 qtr.	$ 847,300	$ 92,750	$ 646,250	$ 77,600	$ 201,050	$ 15,150
2	1,013,250	116,700	789,550	97,000	223,700	19,700
3	953,850	73,800	720,700	56,250	233,150	17,550
4	1,129,700	121,150	886,650	101,450	243,050	19,700
Total	$ 3,944,100	$ 404,400	$3,043,150	$ 332,300	$ 900,950	$ 72,100
1979-1 qtr.	$ 1,322,800	$ 148,600	$1,031,550	$ 126,700	$ 291,250	$ 21,900
2	1,189,000	167,450	963,300	120,250	225,700	47,200
3	1,171,850	181,350	969,400	151,100	202,450	30,250
4	1,172,850	267,550	901,550	231,250	271,300	36,300
Total	$ 4,856,500	$ 764,950	$3,865,800	$ 629,300	$ 990,700	$ 135,650
1980-1 qtr.	$ 1,331,950	$ 185,500	$1,057,900	$ 149,900	$ 274,050	$ 35,600
2	1,210,050	125,300	1,054,300	87,800	155,750	37,500
3	825,350	92,150	659,050	69,250	166,300	22,900
4	872,200	111,800	724,250	82,300	147,950	29,500
Total	$ 4,239,550	$ 514,750	$3,495,500	$ 389,250	$ 744,050	$ 125,500
1981-1 qtr.	$ 809,950	$ 110,400	$ 615,250	$ 91,350	$ 194,700	$ 19,050
2	723,600	143,400	559,950	101,250	163,650	42,150
3	530,650	62,800	408,100	47,150	122,550	15,650
4	498,450	65,600	362,500	42,550	135,950	23,050
Total	$ 2,562,650	$ 382,200	$1,945,800	$ 282,300	$ 616,850	$ 99,900
1982-1 qtr.	$ 432,300	$ 74,500	$ 328,400	$ 56,450	$103,900	$ 18,050
2	303,050	79,600	216,450	58,300	86,600	21,300
3	237,300	42,650	154,000	29,450	83,300	13,200
4	288,700	39,650	190,750	30,650	97,950	9,000
Total	$ 1,261,350	$236,400	$ 889,600	$174,850	$371,750	$ 61,550
1983-1 qtr.	$ 285,550	$ 29,300	$ 205,850	$ 18,250	$ 79,700	$ 11,050
2	366,700	32,400	250,300	19,000	116,400	13,400
3	439,450	28,700	305,900	16,300	133,550	12,400
4	466,500	47,550	307,400	28,650	159,100	18,900
Total	$ 1,558,200	$137,950	$1,069,450	$ 82,200	$488,750	$ 55,750

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOL PRODUCTS

By Type of Machine, 1975 to Date

(Millions of Dollars)

	1975	1976	1977	1978	1979	1980	1981	1982
MACHINE TOOLS TOTAL	$3,431.8	$3,197.4	$3,675.2	$4,735.0	$5,762.3	$6,701.5	$7,206.1	$5,566.5
METAL CUTTING TOTAL	2,405.7	2,146.4	2,560.5	3,377.1	4,127.5	4,952.3	5,554.0	4,175.7
Boring Machines	90.6	80.2	93.5	133.0	169.9	200.0	227.0	204.8
Drilling Machine	97.9	(99.0)	108.9	(155.0)	167.1	188.8	155.0	66.7
Gear Cutting & Finishing Machines	71.7	61.9	67.1	111.5	104.6	124.7	132.5	87.1
Grinding & Polishing Machines (a)	276.2	243.5	288.3	359.5	464.5	553.8	623.3	516.9
Lathes	474.0	449.8	455.9	554.9	675.7	823.0	865.3	523.6
Milling Machines	141.9	146.8	167.8	204.8	259.3	(322.0)	390.4	311.1
Other Machine Tools (b)	802.3	629.8	713.6	994.8	1,279.3	1,620.8	1,838.3	1,394.5
Parts (c)	382.8	400.7	502.1	606.0	813.7	877.3	1,038.2	901.8
Not Specified by Kind	(68.4)	(34.7)	163.3	(s)	(193.3)	(241.8)	(284.0)	169.4
METAL FORMING TOTAL	1,026.1	1,051.0	1,114.7	1,357.9	1,634.8	1,749.2	1,652.1	1,390.8
Punching, Shearing, Bending & Forming	242.3	271.3	280.1	320.4	389.9	429.0	444.1	324.5
Presses (d)	282.8	268.1	282.6	369.1	449.5	498.5	422.7	370.2(e)
Other (b)	162.3	157.0	171.7	220.3	264.4	238.9	221.4	222.8(e)
Parts (c)	322.8	344.3	295.5	400.5	482.5	530.8	498.4	372.7
Not Specified by Kind	(15.9)	(10.2)	84.8	(s)	48.5	52.0	65.5	100.7

(a) Excluding Gear-Tooth Grinding, Honing, Lapping, Polishing and Buffing Machines.
(b) Including those designed primarily for Home Workshops, Laboratories, etc.
(c) Parts sold separately and rebuilt machine tools.
(d) Including Forging Presses.
(e) In 1982, Forging is included in "Other" metal forming machine tools.
(s) Withheld because estimate did not meet publication standards.
( ) Indicates standard errors exceeding 15%.

This table includes machine tool products only—those produced as "primary" products of the machine tool industry and as "secondary" products by other industries.

Sources: U.S. Bureau of the Census; "Census of Manufactures, Metal Working Machinery and Equipment" and "Annual Survey of Manufactures".

SHIPMENTS OF MACHINE TOOLS

Metal Cutting and Metal Forming, Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 671,907	NA	NA	NA	NA
1959	196,701	679,538	65,892	$ 648,368	130,809	$ 31,170
1960	183,142	777,692	62,225	749,900	120,917	27,792
1961	170,982	764,453	57,503	737,051	113,479	27,402
1962	190,288	867,269	67,678	837,370	122,610	29,899
1963	198,571	967,133	73,255	934,485	125,316	32,648
1964	212,257	1,209,076	81,020	1,176,645	131,237	32,431
1965	250,492	1,457,685	93,350	1,418,294	157,142	39,391
1966	321,705	1,712,849	112,654	1,658,651	209,051	54,198
1967	311,472	1,869,298	117,651	1,820,197	193,821	49,101
1968	301,114	1,722,727	95,927	1,668,852	205,187	53,875
1969	308,273	1,692,188	92,148	1,631,239	216,125	60,949
1970	252,431	1,551,777	73,517	1,501,454	178,914	50,323
1971	211,432	1,057,870	51,843	1,009,389	159,589	48,481
1972	267,065	1,269,302	71,655	1,220,521	195,410	48,781
1973	307,680	1,787,850	94,833	1,724,719	212,847	63,131
1974	337,799	2,165,937	106,016	2,096,198	231,783	69,739
1975	280,341	2,406,082	92,731	2,353,936	187,610	52,146
1976	270,875	2,178,265	82,937	2,119,846	187,938	58,419
1977	284,583	2,453,423	92,270	2,393,964	192,313	59,459
1978	327,460	3,142,594	87,589	3,050,209	239,871	92,385
1979	345,218	4,064,045	89,586E	3,934,566E	255,632E	129,479E
1980	323,899	4,812,349	88,428E	4,674,068E	235,471E	138,281E
1981	301,313	5,111,253	87,981E	5,007,848E	213,332E	103,405E
1982(r)	186,800	3,748,911	57,178E	3,678,978E	129,622E	69,933E
1983(p)	155,164	2,132,649	50,401E	2,074,297E	104,763E	58,352E

p - Preliminary. r - Revised. NA - Not Available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

Data on shipments of complete machine tools published in the "Current Industrial Reports" series of the Census tend to vary slightly from those published by NMTBA. There are several reasons for the difference; among them is the fact that NMTBA reports are extended to a 100 percent estimate based on earlier coverage by the "Current Industrial Reports" series. Refer to this chapter's introduction for a detailed explanation of the various sources of statistics for machine tools.

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 462,934	NA	NA	NA	NA
1959	143,380	468,777	45,212	$ 447,009	98,168	$ 21,768
1960	133,511	539,340	42,914	520,294	90,597	19,046
1961	124,260	531,343	40,363	512,424	83,897	18,919
1962	138,855	626,833	47,942	606,297	90,913	20,536
1963	139,896	657,607	50,353	635,157	89,543	22,450
1964	153,831	874,467	58,714	852,392	95,117	22,075
1965	184,168	1,047,823	68,005	1,021,331	116,163	26,492
1966	242,698	1,231,907	80,673	1,194,149	162,025	37,758
1967	236,167	1,373,178	86,014	1,336,419	150,153	36,759
1968	225,778	1,309,361	70,505	1,271,876	155,273	37,485
1969	229,974	1,242,550	65,199	1,198,504	164,775	44,046
1970	188,491	1,097,718	49,314	1,061,066	139,177	36,652
1971	157,099	714,454	32,443	677,841	124,656	36,613
1972	207,290	857,964	47,846	821,899	159,444	36,065
1973	252,237	1,224,715	63,685	1,175,058	188,552	49,657
1974	272,811	1,525,575	69,060	1,466,671	203,751	58,904
1975	229,169	1,790,360	65,883	1,750,797	163,286	39,563
1976	212,757	1,592,216	54,974	1,546,631	157,783	45,585
1977	220,017	1,791,293	59,500	1,743,724	160,517	47,569
1978	257,647	2,334,425	58,116	2,265,541	199,531	68,[illegible]
1979	263,019	3,037,205	59,453E	2,943,225E	203,566E	93,[illegible]E
1980	248,563	3,716,370	62,185E	3,612,645E	186,378E	103,725E
1981	234,647	4,046,940	66,076E	3,978,970E	168,571E	67,970E
1982(r)	140,916	2,922,245	40,474E	2,876,082E	100,442E	46,163E
1983(p)	107,324	1,584,907	35,563E	1,552,181E	71,761E	32,726E

p - Preliminary. r - Revised. NA - Not available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 203,973	NA	NA	NA	NA
1959	53,321	210,761	20,680	$ 201,359	32,641	$ 9,402
1960	49,631	238,352	19,311	229,606	30,320	8,746
1961	46,722	233,110	17,140	224,627	29,582	8,483
1962	51,433	240,436	19,736	231,073	31,697	9,363
1963	58,675	309,526	22,902	299,328	35,773	10,198
1964	58,426	334,609	22,306	324,253	36,120	10,356
1965	66,324	409,862	25,345	396,963	40,979	12,899
1966	79,007	480,942	31,981	464,502	47,026	16,440
1967	75,305	496,120	31,637	483,778	43,668	12,342
1968	75,336	413,366	25,422	396,976	49,914	16,390
1969	78,299	449,638	26,949	432,735	51,350	16,903
1970	63,940	454,059	24,203	440,388	39,737	13,671
1971	54,333	343,416	19,400	331,548	34,933	11,868
1972	59,775	411,338	24,107	398,622	35,668	12,716
1973	55,443	563,135	31,148	549,661	24,295	13,474
1974	64,988	640,362	36,956	629,527	28,032	10,835
1975	51,172	615,722	26,848	603,139	24,324	12,583
1976	58,118	586,049	27,963	573,215	30,155	12,834
1977	64,566	662,130	32,770	650,240	31,796	11,890
1978	69,813	808,169	29,473	784,668	40,340	23,501
1979	82,199	1,026,840	30,133	991,341	52,066	35,499
1980	75,336	1,095,979	26,243	1,061,423	49,093	34,556
1981	66,666	1,064,313	21,905	1,028,878	44,761	35,435
1982(r)	45,884	826,666	16,704E	802,896E	29,180E	23,770E
1983(p)	47,840	547,742	14,838E	522,116E	33,002E	25,626E

p - Preliminary. r - Revised. NA - Not Available. E - Estimate

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series, MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1954 to Date

(Millions of Dollars)

Year	TOTAL	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting Machines
1954	$ 879.0	$114.4	$ 86.1	$ 48.1	$154.3	$206.9	$122.5	$ 146.7
1955	665.8	77.4	53.8	36.6	123.9	153.3	89.6	131.2
1956	891.8	101.8	65.4	49.4	172.8	217.1	115.8	169.5
1957	878.3	102.0	56.3	38.9	160.1	199.8	155.0	166.2
1958	463.0	51.6	30.0	22.7	89.4	98.7	89.3	81.3
1959	468.8	46.2	33.4	24.7	93.8	119.5	73.3	77.9
1960	539.3	46.9	38.9	34.3	117.0	135.4	79.4	87.4
1961	531.3	51.5	36.8	36.4	121.0	126.5	73.7	85.4
1962	626.8	61.4	53.2	35.8	127.9	152.3	95.8	100.4
1963	657.6	67.9	52.0	39.5	136.8	154.8	106.1	100.5
1964	874.5	74.1	72.3	47.1	175.9	198.1	125.8	181.2
1965	1,047.8	91.9	83.2	55.7	213.6	234.8	144.0	224.7
1966	1,231.9	110.9	105.9	59.0	235.9	286.5	201.7	232.0
1967	1,373.2	117.8	122.8	63.9	247.8	334.0	234.3	252.6
1968	1,309.4	93.7	67.7	68.2	235.1	316.2	234.1	294.4
1969	1,242.6	80.2	67.5	65.6	227.3	288.9	184.6	328.5
1970	1,097.7	62.1	70.9	66.3	219.4	240.1	110.0	329.0
1971	714.5	35.8	43.4	50.1	142.9	174.9	54.4	212.7
1972	858.0	54.1	65.8	50.3	151.0	203.2	81.7	251.9
1973	1,224.7	66.7	90.5	55.4	209.6	299.0	104.6	398.9
1974	1,525.6	81.4	77.9	66.2	249.9	370.2	137.7	542.3
1975	1,790.4	83.9	92.9	65.1	273.2	464.2	134.0	677.1
1976	1,592.2	77.8	100.4	56.0	246.8	430.3	134.4	546.6
1977	1,791.3	84.9	107.2	61.4	273.1	436.3	160.2	668.1
1978	2,334.4	117.7	152.4	102.7	348.6	535.9	194.3	882.9
1979	3,037.2	177.4	150.5	111.2	474.9	650.3	279.8	1,193.1
1980	3,716.4	192.0	166.9	130.3	555.8	827.0	339.3	1,505.2
1981	4,046.9	231.0	140.0	133.1	615.4	816.8	436.6	1,674.2
1982(r)	2,922.2	193.8	102.7	86.5	459.8	525.7	302.6	1,251.2
1983(p)	1,584.9	95.1	60.5	35.6	283.7	345.7	186.9	577.4

p - Preliminary. r - Revised.

Note: Other Metal Cutting Machines include machining centers, transfer machines, shapers, sawing and cutoff machines, and other metal cutting machines not classified elsewhere. For a breakdown by type, refer to pages detailing shipments of these machines also appearing in this chapter.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
By Class of Product, 1954 to Date

(Percentage of Dollar Value)

Year	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting & Finishing	35414 Grinding & Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting
1954	13.0%	9.8%	5.5%	17.6%	23.5%	13.9%	16.7%
1955	11.6	8.1	5.5	18.6	23.0	13.5	19.7
1956	11.4	7.3	5.5	19.4	24.3	13.0	19.0
1957	11.6	6.4	4.4	18.2	22.7	17.6	18.9
1958	11.1	6.5	4.9	19.3	21.3	19.3	17.6
1959	9.9	7.1	5.3	20.0	25.5	15.6	16.6
1960	8.7	7.2	6.4	21.7	25.1	14.7	16.2
1961	9.7	6.9	6.9	22.8	23.8	13.9	16.1
1962	9.8	8.5	5.7	20.4	24.3	15.3	16.0
1963	10.3	7.9	6.0	20.8	23.5	16.1	15.3
1964	8.5	8.3	5.4	20.1	22.7	14.4	20.7
1965	8.8	7.9	5.3	20.4	22.4	13.7	21.4
1966	9.0	8.6	4.8	19.1	23.3	16.4	19.8
1967	8.6	8.9	4.7	18.0	24.3	17.1	18.4
1968	7.2	5.2	5.2	18.0	24.1	17.9	22.5
1969	6.5	5.4	5.3	18.3	23.2	14.9	26.4
1970	5.7	6.5	6.0	20.0	21.9	10.0	30.0
1971	5.0	6.1	7.0	20.0	24.5	7.6	29.8
1972	6.3	7.7	5.9	17.6	23.7	9.5	29.4
1973	5.4	7.4	4.5	17.1	24.4	8.5	32.6
1974	5.3	5.1	4.3	16.4	24.3	9.0	35.6
1975	4.7	5.2	3.6	15.3	25.9	7.5	37.8
1976	4.9	6.3	3.5	15.5	27.0	8.4	34.3
1977	4.7	6.0	3.4	15.2	24.4	8.9	37.3
1978	5.0	6.5	4.4	14.9	23.0	8.3	37.9
1979	5.8	5.0	3.7	15.6	21.4	9.2	39.3
1980	5.2	4.5	3.5	15.0	22.3	9.1	40.5
1981	5.7	3.5	3.3	15.2	20.2	10.8	41.4
1982(r)	6.6	3.5	3.0	15.7	18.0	10.4	42.8
1983(p)	6.0	3.8	2.2	17.9	21.8	11.8	36.4

p - Preliminary. r - Revised.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Report, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1954 to Date

(Millions of Dollars)

Year	TOTAL (a)	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1954	$ 350.2	$ 216.4	$ 24.4	$ 26.3	$ 35.6	$ 47.5
1955	295.4	170.8	15.6	28.9	35.8	44.3
1956	384.1	240.1	15.5	34.9	48.8	44.8
1957	403.2	238.7	24.7	38.3	43.9	57.6
1958	209.0	76.5	17.4	32.0	32.1	51.0
1959	210.8	84.6	17.9	29.9	35.7	42.7
1960	238.4	105.0	21.0	32.9	34.3	45.2
1961	233.1	111.3	15.8	33.3	32.5	40.2
1962	240.4	109.5	23.7	34.5	29.0	43.7
1963	309.5	136.0	22.3	42.8	45.2	63.2
1964	334.6	169.5	23.1	33.2	42.7	66.1
1965	409.9	209.2	32.8	43.9	49.4	74.6
1966	480.9	253.3	32.7	49.7	51.0	94.2
1967	496.1	240.1	29.6	56.9	57.4	112.1
1968	413.4	199.1	31.9	57.1	64.4	60.9
1969	449.6	223.7	32.0	53.6	66.0	74.3
1970	454.1	239.6	36.6	47.7	59.8	70.4
1971	343.4	166.5	37.0	41.4	53.3	45.2
1972	411.3	166.7	34.5	62.5	67.9	79.8
1973	563.1	242.7	38.7	75.8	94.5	111.4
1974	640.4	307.0	40.1	86.1	113.0	94.2
1975	615.7	269.4	39.5	121.0	115.4	70.4
1976	586.0	223.6	52.2	120.0	118.8	71.4
1977	662.1	260.7	55.1	130.6	137.2	78.5
1978	808.2	350.9	59.3	146.6	147.7	103.7
1979	1,026.8	434.0	84.7	181.2	183.4	143.5
1980	1,096.0	440.8	73.8	204.2	214.9	162.3
1981	1,064.3	429.6	79.0	206.1	212.8	136.8
1982(r)	826.7	338.7	78.8	137.9	157.8	113.4
1983(p)	547.7	149.2	46.3	116.6	133.1	102.6

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1954 to Date
(Percentage of Dollar Value)

Year	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35435 (In Part) Other (a)
1954	61.8%	7.0%	7.5%	10.2%	13.5%
1955	57.8	5.3	9.8	12.1	15.0
1956	62.5	4.0	9.1	12.7	11.7
1957	59.2	6.1	9.5	10.9	14.3
1958	36.6	8.3	15.3	15.4	24.4
1959	40.1	8.5	14.2	16.9	20.3
1960	44.0	8.8	13.8	14.4	19.0
1961	47.7	6.8	14.3	13.9	17.3
1962	45.5	9.9	14.3	12.1	18.2
1963	44.0	7.2	13.8	14.6	20.4
1964	50.7	6.9	9.9	12.8	19.7
1965	51.0	8.0	10.7	12.1	18.2
1966	52.7	6.8	10.3	10.6	19.6
1967	48.4	5.9	11.5	11.6	22.6
1968	48.2	7.7	13.8	15.6	14.7
1969	49.8	7.1	11.9	14.7	16.5
1970	52.7	8.1	10.5	13.2	15.5
1971	48.5	10.8	12.0	15.5	13.2
1972	40.5	8.4	15.2	16.5	19.4
1973	43.1	6.9	13.4	16.8	19.8
1974	47.9	6.3	13.4	17.7	14.7
1975	43.8	6.4	19.7	18.7	11.4
1976	38.2	8.9	20.5	20.3	12.2
1977	39.4	8.3	19.7	20.7	11.9
1978	43.4	7.3	18.1	18.3	12.9
1979	42.3	8.2	17.6	17.9	14.0
1980	40.2	6.7	18.6	19.6	14.8
1981	40.4	7.4	19.4	20.0	12.9
1982(r)	41.0	9.5	16.7	19.1	13.7
1983(p)	27.2	8.5	21.3	24.3	18.7

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
TOTAL	1970(a)	1,901	$209.0	1982(r,g)	6,218	$ 1,152.1
	1971(a)	1,238	153.2	1983(p,g)	4.737	679.7
	1972(a)	1,630	170.1			
	1973(a)	2,865	272.1			
	1974(a)	4,210	378.7			
	1975(a)	4,136	504.7			
	1976(a)	3,856	501.0			
	1977(a)	4,482	496.7			
	1978(a)	5,688	649.2			
	1979(g)	7,925	1,014.6			
	1980(g)	9,984	1,371.7			
	1981(g)	8,945	1,467.3			
Boring Machines	1970	175	29.5	1982	231	110.7
	1971	92	18.4	1983(p)	69	37.1
	1972	84	21.0			
	1973	128	26.8			
	1974	146	33.7			
	1975	153	39.4			
	1976	120	35.6			
	1977	101	33.0			
	1978	127	47.3			
	1979	186	69.6			
	1980	226	92.5			
	1981	293	120.2			
Drilling Machines	1970	215	13.0	1982(r)	279	34.9
	1971	138	11.3	1983(p)	213	18.5
	1972	118	8.4			
	1973	326	19.0			
	1974	216	11.7			
	1975	100	11.0			
	1976	197	13.2			
	1977	288	20.0			
	1978	321	22.0			
	1979	237	17.7			
	1980	384	33.4			
	1981	455	52.8			
Lathes	1970	507	55.3	1982(r)	1,489	333.4
	1971	428	50.4	1983(p)	1,203	226.7
	1972	570	67.1			
	1973	1,031(c)	95.2(c)			
	1974	1,381	137.3			
	1975	1,640	212.7			
	1976	1,321	205.9			
	1977	1,178	195.3			
	1978	1,464	237.2			
	1979	2,362	347.7			
	1980	2,739	481.2			
	1981	2,021	441.4			

(Continued)

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
Milling Machines (d)						
	1970	150	$ 23.4	1982(r)	1,051	$ 205.8
	1971	105	12.6	1983(p)	1,069	108.9
	1972	229	15.8			
	1973	240	16.1			
	1979	2,045	93.8			
	1980	2,600	162.7			
	1981	1,763	190.6			
Machining Centers						
	1970	651	68.9	1982(r)	1,264	338.8
	1971	344	46.6	1983(p)	803	166.3
	1972	475	45.3			
	1973	1,162	115.1			
	1974	1,692	163.1			
	1975	1,460	196.8			
	1976	1,225	178.4			
	1977	1,201	175.0			
	1978	1,486	246.0			
	1979	1,953	356.5			
	1980	2,132	413.0			
	1981	2,081	482.7			
Grinding and Polishing Machines						
	1979	206	28.6	1982(r)	490	42.4
	1980	271	32.9	1983(p)	449	41.5
	1981	645	46.7			
All Other Metal Cutting and Metal Forming Type Machine Tools						
	1970	203	19.0	1982(r)	1,414(g)	86.2(g)
	1971	131	13.9	1983(p)	931(g)	80.6(g)
	1972	154	12.6			
	1973	17(a,e)	5.0(a,e)			
	1974	775(a,f)	32.8(a,f)			
	1975	783(a,f)	44.8(a,f)			
	1976	993(a,f)	67.9(a,f)			
	1977	1,714(a,f)	73.4(a,f)			
	1978	2,290(a,f)	96.7(a,f)			
	1979	936(g)	100.7(a,f)			
	1980	1,632(g)	156.0(g)			
	1981	1,667(g)	133.0(g)			

p - Preliminary. r - Revised.

(a) No metal forming NC data are included.
(b) Beginning with 1973, data no longer published.
(c) Includes data for grinding and polishing machines.
(d) For 1974-1978 data were included in the "All Other" category.
(e) For 1973 only, grinding and polishing machines are reported with lathes and are not included in the "All Other" category.
(f) Includes milling machines and grinding and polishing machines.
(g) Includes data for punching, shearing, bending, and forming machines; all other metal forming NC data withheld to avoid disclosure.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

NUMERICALLY CONTROLLED AND AUTOMATIC METALWORKING MACHINERY
By Type of Control
Total Shipments and Unfilled Orders, 1964 to 1972 (a)

	SHIPMENTS			UNFILLED ORDERS December 31		
		Millions of Dollars			Millions of Dollars	
	Number of Machines	Machines & Controls	Controls Only	Number of Machines	Machines & Controls	Controls Only
TOTAL						
1964	1,517	$ 105.5	$ 29.2	987	$ 113.7	$ 26.4
1965	2,100	159.3	43.9	1,964	211.3	57.1
1966	2,939	249.1	55.5	2,439	329.3	75.7
1967	2,957	284.9	69.4	2,054	337.9	72.1
1968	2,917	353.8	81.2	1,336	253.8	53.3
1969	2,376	293.9	70.2	1,148	172.3	36.9
1970	1,901	209.0	50.1	683	121.8	26.3
1971	1,238	153.2	36.0	581	107.7	23.3
1972	1,630	170.1	42.3	1,334	182.1	50.6
Point-to-Point Positioning						
1964	1,145	52.4	15.0	586	43.9	12.2
1965	1,604	89.0	25.9	1,278	93.5	25.6
1966	2,044	126.4	26.1	1,422	139.0	33.4
1967	2,050	143.0	36.1	1,033	100.3	24.0
1968	1,752	141.6	34.8	530	67.3	16.4
1969	1,324	110.2	27.6	507	54.7	12.8
1970	1,033	82.3	19.2	222	38.3	7.7
1971	476	50.4	11.2	146	30.3	6.2
1972	605	49.5	10.4	337	50.8	15.7
Continuous Path Activated by Tape or Punch Card						
1964	172	36.7	11.2	151	35.0	10.7
1965	229	43.7	13.8	383	86.1	25.7
1966	524	79.5	22.9	637	151.4	33.8
1967	621	113.2	27.3	782	211.4	41.4
1968	991	198.2	43.2	700	176.6	34.5
1969	899	171.0	39.8	577	108.6	22.7
1970	785	118.9	29.5	423	78.4	17.9
1971	711	97.6	23.8	425	76.6	16.9
1972	989	117.4	31.3	977	128.3	34.4
Dial or Plug Board Type of Prerecorded Motion Program Control						
1964	200	16.4	3.0	250	34.8	3.5
1965	267	26.6	4.2	303	31.7	5.8
1966	371	43.2	6.5	380	38.9	8.5
1967	286	28.7	6.0	239	26.2	6.7
1968	174	14.0	3.2	106	9.9	2.4
1969	153	12.7	2.8	64	9.0	1.4
1970	83	7.9	1.4	38	5.1	0.7
1971	51	5.2	0.9	10	0.8	0.2
1972	36	3.3	0.6	20	3.0	0.4

(a) The publication of this data was discontinued in 1973.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BORING MACHINES
Units and Value, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982	1983(p)
UNITS								
TOTAL	662	761	922	1,671	1,793	1,699	994	452
Horizontal Boring, Drilling & Milling Machines								
Table Type	175	81	104	97	102	115	77	29
Floor Type		88	85	82	72	29		
Precision Boring Machines	487	509	648	868	771	661	564	370
Jig Boring Machines		83	85	624	848	894	353	53(a)
All Other Boring Machines		—						
VALUE (Millions of Dollars)								
TOTAL	$77.8	$84.9	$117.7	$177.7	$192.0	$231.0	$193.8	$59.1
Horizontal Boring, Drilling and Milling Machines								
Table Type	40.6	23.3	35.6	38.1	41.4	53.0	51.4	22.1
Floor Type		15.4	15.3	21.4	23.8	15.5		
Precision Boring Machines	37.2	32.0	50.2	87.8	96.3	122.1	109.7	60.5
Jig Boring Machines		14.2	16.6	30.1	30.5	40.4	32.6	12.5(a)
All Other Boring Machines		—						

p - Preliminary.

(a) There were no machines valued less than $2,500.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GEAR CUTTING MACHINES
Units and Value, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
TOTAL	509	624	878	828	931	837	445	157
Gear Tooth Finishing Machines(a)	509	384	488	646	432	254	160	89
Gear Hobbers-Horizontal and Vertical (b)		240	390	182	499	583	285	68
All Other Gear Cutting Machines		0	0	(c)	(c)	(c)	0	0
VALUE (Millions of Dollars)								
TOTAL	$56.0	$61.4	$102.7	$111.2	$130.3	$133.1	$86.5	$35.6
Gear Tooth Finishing Machines (a)	56.0	42.8	66.2	91.3	69.0	55.3	39.9	24.6
Gear Hobbers-Horizontal and Vertical (b)		18.6	36.4	19.9	61.3	77.9	46.7	10.9
All Other Gear Cutting Machines		0	0	(c)	(c)	(c)	0	0

p - Preliminary. r - Revised.

(a) Includes level gear generators.
(b) Includes gear shapers.
(c) Included in gear tooth finishing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF DRILLING MACHINES
Units and Value, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS TOTAL	40,664	42,815	52,247	44,697	34,898	27,195	22,913	14,976
Unit Value Under $1,000(a)	36,154	36,971	49,412	41,476	31,474	24,129	20,878	13,618
Unit Value $1,000 and Over(b)	4,510	5,844	2,835	3,221	3,424	3,066	2,035	1,358
Vertical Drilling Machines								
Plain Upright	929	1,530	438	1,339(d)	1,089(e)	892(e)	592(e)	298(e)
Indexing Turret Head, Heavy Duty and Other	289(d)E	249(d)	277(d)					
Radial Drilling Machines								
Plain and Universal Under 13"	175	68	54	226	232	331	154	120
All Other	D	D	D					
Deep Hole Drilling Machines	(c)	(c)	(c)	184	190	154	110	
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	502	301E	290	378	628	522	371	202
Automatic Drilling		D	598	797	(c)	(c)	368	738
All Other	112	105	D					
All Other Drilling Machines	1,835	2,202	256	297	1,285	1,167	440	
VALUE (Millions of Dollars) TOTAL	$100.4	$107.2	$152.4	$150.5	$186.9	$139.9	$102.7	$60.5
Unit Value Under $1,000(a)	13.2	12.8	22.2	25.9	18.6	20.2	17.6	12.6
Unit Value $1,000 & Over(b)	87.2	94.4	130.2	124.6	148.3	119.8	85.1	47.9
Vertical Drilling Machines								
Plain Upright	3.3	3.9	2.6	18.2(e)	22.7(e)	21.1(e)	14.7(e)	6.9(e)
Indexing Turret Head, Heavy Duty and Other	6.4(d)E	5.9(d)	7.5(d)					
Radial Drilling Machines								
Plain and Universal Under 13"	2.7	2.1	1.7	9.7	12.6	14.0	5.2	7.6
All Other	D	D	D					
Deep Hole Drilling Machines	(c)	(c)	(c)	5.8	10.6	15.7	10.4	
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	43.9	13.5E	11.6	21.1	26.2	20.1	10.4	6.2
Automatic Drilling		D	67.0	57.0	(c)	(c)	28.0	27.3
All Other	11.5	6.4	D					
All Other Drilling Machines	8.7	11.2	9.5	18.6	76.2	47.8	16.4	

p - Preliminary. r - Revised. D - Withheld to avoid disclosure. E - Estimate by NMTBA.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and over for 1978 to date.
(c) Included with "All Other Drilling Machines."
(d) Includes only heavy duty. Disclosure was reported for indexing turret head and other.
(e) Includes all vertical drilling machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units and Value, 1971 to 1978

Products	1971(c)	1972(c)	1973(c)	1974(c)	1975(c)	1976(c)	1977(c)	1978(c)
UNITS								
TOTAL	11,071	12,295	16,904	19,305	17,581	14,085	11,249	13,557
Unit Value Under $1,000 (a)	D	D	D	D	D	D	D	D
Unit Value $1,000 and Over (b)	D	D	D	D	D	D	D	D
Bench Lathes (Except Bench Turret Lathes)	D	D	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy), Floor Mounted								
Up to and Including 16" Swing Over Cross Slide	4,317	4,383	6,611	3,929(f)	3,836(f)	2,869(f)	4,510	3,640
17" to 23" Swing	139	126	285	(g)	(g)	(g)	157E	141
24" Swing and Over	61	53	52	296	321	300	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	1,804	1,965
Turret Lathes								
Bench and Floor Light Duty Type	1,052(d)	665(d)	D	D	D	D	D	D
Ram Type	100E							
Automatic Chucking Lathes								
Single Spindle	351	547	828	896	1,050	637(h)E	790(h)	1,076(h)
Multiple Spindle	231	182	270	248	214	174	214	255
Automatic Between Center Lathes	88	107	217	236	179	99	141	179
Screw (bar) Machines	933	1,107	1,434	1,676	1,189	1,051(i)E	696(i)	782(i)
Vertical Turning and Boring Mills	87E	98E	108	153	183	171	121	129
All Other	631	465	1,893	505	448	701	712	846
VALUE (Millions of Dollars)								
TOTAL	$174.9	$203.2	$299.0	$370.2	$464.2	$430.3	$436.3	$535.9
Unit Value Under $1,000 (a)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Unit Value $1,000 and Over (b)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Bench Lathes (Except Bench Turret Lathes)	(D)	(D)	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy), Floor Mounted								
Up to and Including 16" Swing Over Cross Slide	26.3	28.4	48.8	50.5(f)	55.9(f)	54.6(f)	53.4	64.0
17" to 23" Swing	6.3	4.0	10.4	(g)	(g)	(g)	11.1E	18.4
24· Swing and Over	6.5	6.5	3.8	20.7	31.8	30.6	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	18.7	23.1
Turret Lathes								
Bench and Floor Light Duty Type	15.1(d)	22.0(d)	D	D	D	D	D	D
Ram Type	2.7E							
Automatic Chucking Lathes								
Single Spindle	21.3	27.3	47.7	60.2	82.6	59.4(h)E	72.2(h)	100.9(h)
Multiple Spindle	20.9	17.0	30.1	27.6	32.3	30.6	37.9	50.2
Automatic Between Center Lathes	5.4	8.0	14.5	19.0	18.6	13.4	23.0	31.4
Screw (bar) Machines	36.3	42.8	56.9	70.1	73.7	52.9(i)E	61.4(i)	71.5(i)
Vertical Turning and Boring Mills	18.4E	20.7E	20.2	30.9	42.3	46.1	38.5	42.2
All Other	12.1	20.3	30.6	26.3	38.7	26.7	29.9	48.1

E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average Under $2,500.
(b) Average $2,500 and over.
(c) Data for specific machines limited to machines valued at $1,000 or over through 1977, $2,500 or over beginning in 1978.
(d) Includes saddle type.
(e) Included with "All Other".
(f) Excludes 8" and under.
(g) Included with 24" Swing and Over.
(h) Includes single spindle with index turret only. Disclosure was reported for single spindle without index turret.
(i) Includes multiple spindle only. Disclosure was reported for single spindle.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units and Value, 1979 to Date
(Millions of Dollars)

Products	1979	1980	1981	1982(r)	1983(p)
UNITS					
TOTAL	20,107	17,937	16,904	10,755	11,960
NUMERICALLY CONTROLLED					
UNIT VALUE OVER $2,500					
Turning Machines-Horizontal Spindle					
Small	1,293	1,532	977	775	793
Medium	766	768	541	308	194
Large	121	224	266	212	117
Turning Machines-Vertical Spindle Turret & Boring Machines over 30" All Other	182	215	237	194	99
NON-NUMERICALLY CONTROLLED					
UNIT VALUE UNDER $2,500	D	D	D	247	275
UNIT VALUE $2,500 and Over	D	D	D	9,019	10,482
Mfg, Tool Room and Engine & Tool Room (Light and Heavy)					
Floor Mounted					
0" to 16" Swing Over Cross Slide	3,200	2,211	2,657	1,365	1175
17" to 23" Swing 24" and Over All Other Engine & Tool Room Lathes	288	246	240	155	61
Turret Lathes					
Horizontal Type	916	1,063	D	D	D
Automatic Lathes-Single Spindle					
Bar (Screw) Machines	D	D	D	D	D
Chucking Machines	563	561	357	136	D
Automatic Lathes-Multiple Spindle					
Bar (Screw) Machines	759	848	809	293	233
Chucking Machines	146	176	131	54	D
Automatic Between Center Lathes All Other Horizontal Turning Machines	87	115	182	62	D
Vertical Turret Lathes and Boring Machines	246	D	D	D	D
All Other Vertical Turning Machines	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D
VALUE (Millions of Dollars)					
TOTAL	$650.3	$827.0	$816.8	$525.7	$345.7
NUMERICALLY CONTROLLED					
AVERAGE OVER $2,500					
Turning Machines-Horizontal Spindle					
Small	107.9	167.0	134.2	87.9	84.1
Medium	147.0	168.5	128.7	74.8	41.1
Large	29.5	64.5	83.7	75.8	50.0
Turning Machines-Vertical Spindle Turret & Boring Machines over 30" All Other	63.3	81.1	94.8	94.8	51.5
NON-NUMERICALLY CONTROLLED					
UNIT VALUE UNDER $2,500	D	D	D	0.5	0.7
UNIT VALUE $2,500 and Over	D	D	D	191.8	118.3
Mfg, Tool Room Lathes and Engine & Tool Room (Light and Heavy)					
Floor Mounted					
0" to 16" Swing Over Cross Slide	36.8	26.2	27.9	20.3	15.7
17" to 23" Swing 24" and Over All Other Engine and Tool Room Lathes	17.7	29.0	27.8	20.4	9.4
Turret Lathes					
Horizontal Type	15.0	17.3	D	D	D
Automatic Lathes-Single Spindle					
Bar (Screw) Machines	D	D	D	D	D
Chucking Machines	29.3	32.8	26.1	8.2	D
Automatic Lathes-Multiple Spindle					
Bar (Screw) Machines	80.5	89.9	99.6	40.7	24.3
Chucking Machines	25.2	33.5	30.9	14.1	D
Automatic Between Center Lathes All Other Horizontal Turning Machines	12.2	25.8	46.8	15.7	D
Vertical Turret Lathes and Boring Machines	9.7	D	D	D	D
All Other Vertical Turning Machines	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D

D - Withheld to avoid disclosure. r - Revised. p - Preliminary.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (g)
Units, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
TOTAL	86,315	95,234	110,202	107,288	97,004	91,548	57,695	53,978
Unit Value Under $1,000 (a)	72,243	80,484	91,373	89,238	79,509	76,687	48,374	47,070
Unit Value $1,000 and Over (b)	14,072	14,750	18,829	18,050	17,495	14,861	9,321	6,908
External Cylindrical Grinding Machines								
Plain	(e)	172	247	325	297	383	327	120
Universal	231	204	226	313	305	291	236	201
Roll and Centerless	298	(e)						
All Other(c)			546	821	935	880	538	279
Internal Cylindrical	764	781						
Grinding Machines			(e)	(e)	(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	283	271	289	397	348	264	152	115
Reciprocating Table Type								
Vertical and Horizontal	1,523(d)	1,632(d)	1,921(d)	2,217	2,941	1,850	1,265	855
Hand Surface Type	1,836	2,581	2,839	3,147	3,523	1,822	1,165	1,179
Planer Type and All Other	(e)	(e)	(e)		(e)	(e)	(e)	(e)
Bench, Floor and Snag Grinders	1,367	1,066	1,359	728	537	484	366	249
Tool and Cutter Grinding Machines								
Universal Special	1,924	2,079	2,111	2,367	2,610	2,818	1,512	788
Polishing and Buffing Machines								
Stand, drum & disc types	372 E	372	849	543	326	309	(e)	(e)
All Other	647	1,102	2,011	2,083	1,561	1,501	619	49
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	3,059	2,445	1,667	2,154	1,871	1,486	997	(e)
All Other Honing and Lapping Machines			362	535	370	354	(e)	(e)
All Other	1,768E(f)	2,045(f)	4,402(f)	2,420(f)	1,851(f)	2,419(f)	2,144(f)	2,623(f)

p - Preliminary. r - Revised. E - Estimated.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and Over for 1978 to date.
(c) Includes chucking grinders.
(d) Includes "Horizontal" only, disclosure was reported for "Vertical".
(e) Included in "All Other Grinding Machines".
(f) Includes surface grinding-vertical reciprocating, planer type and all other, and Other Grinding Machines, N.E.C.
(g) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (g)
Value, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
VALUE (Millions of Dollars) TOTAL	$246.8	$273.1	$348.6	$474.9	$555.8	$615.4	$459.8	$283.7
Unit Value Under $1,000 (a)	11.1	12.3	11.6	16.8	16.8	17.9	12.7	11.4
Unit Value $ 1,000 and Over (b)	235.7	260.8	337.0	458.1	539.0	597.5	447.1	272.3
External Cylindrical Grinding Machines								
Plain	(e)	19.0	33.6	43.5	42.1	63.9	64.2	28.8
Universal	10.2	9.7	12.0	17.2	17.7	18.6	17.0	16.5
Roll and Centerless	31.0	(e)	64.4	107.5	132.0	160.8	92.6	43.6
All Other (c)	46.7	50.6						
Internal Cylindrical Grinding Machines			(e)	(e)	(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	11.5	14.5	21.2	35.3	36.7	36.5	21.4	14.1
Reciprocating Table Type								
Vertical and Horizontal	18.5(d)	21.1(d)	27.4(d)	35.3	49.1	37.7	30.3	19.1
Hand Surface Type	8.3	11.6	13.3	16.8	21.6	13.8	9.2	8.7
Planer Type and All Other	(e)	(e)	(e)		(e)	(e)	(e)	(e)
Bench, Floor and Snag Grinders	12.0	12.6	16.9	7.5	6.2	7.3	3.2	2.0
Tool and Cutter Grinding Machines								
Universal	16.7	19.0	19.7	26.0	32.5	36.4	26.7	23.5
Special								
Polishing and Buffing Machines								
Stand, drum & disc types	8.8E	7.5	8.4	10.9	5.8	8.6	(e)	(e)
All Other	11.1	19.0	20.6	24.1	28.7	33.2	22.6	14.3
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	22.3	21.9	15.7	20.4	29.1	28.3	20.8	(e)
All Other Honing and Lapping Machines			9.4	10.7	11.7	13.9	(e)	(e)
All Other	38.6E(f)	54.3(f)	74.4(f)	102.9(f)	125.8(f)	138.5(f)	139.1(f)	101.7(f)

p - Preliminary. r - Revised. E - Estimated.

(a) Value under $2,500 for 1978 to date.
(b) Value $2,500 and Over for 1978 to date.
(c) Includes chucking grinders.
(d) Includes "Horizontal" only, disclosure was reported for "Vertical".
(e) Included in "All Other Grinding Machines".
(f) Includes surface grinding-vertical reciprocating, planer type and all other, and Other Grinding Machines, N.E.C.
(g) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Units, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
TOTAL	59,764	56,855	65,239	70,922	76,770	77,220	39,112	17,621
Unit Value Under $1,000 (a)	44,997	41,163	53,432	59,852	64,819	64,347	29,990	9,609
Unit Value $1,000 and Over (b)	14,767	15,118	11,807	11,070	11,951	12,873	9,122	8,012
Broaching Machines								
Hydraulic	198	166	239	295	269	204	136	121
Mechanical and Other								
Planers, Shapers (Except Gear)and Slotters		D	D	(c)	(c)	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	343E	747E	433	453	556	509	562	1,032
Circular Cutoff Saws	1,002	879	164	134	142	145	119	116
Abrasive Cutoff Saws			598	499	526	497	322	219
Band Saw	6,487	7,080	2,889	3,874	4,223	5,316	3,559	2,702
Contour Sawing and Filing Machines	1,030E	D	D	970	619	840	700	752
All Other		342	226					
Tapping Machines	411	328	264	303	286	412	373	460
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool change-Vert. & Horizontal	796	311	327	(f)	(f)	(f)	(f)	(f)
Indexing Turret								
Automatic Tool change								
Vertical		482	611					
Horizontal	429	408	548					
Transfer Machines								
Dial or Rotary	803	885	960	130	451	491	269	269
Way Type				91	126	64	54	46
Station Type, Transfer				574	517	439	318	133
Other, N.E.C.				203	218	185	166	88
Electrical Discharge Machines (EDM)	837	1,043	1,423	1,857	2,234	1,725	1,237	1,053
Electrochemical Machines (ECM)	2,431(e)	2,219(d,e)						
All Other Metal Cutting Machines			3,125(d,e)	1,687	1,784	2,046	1,307	1,021

p - Preliminary. r - Revised. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 or more for 1978 to date.
(c) Included with "All Other".
(d) Excludes planers which were reported as D.
(e) Includes threading machines.
(f) Beginning with 1979 there is a new classification for Machining Centers.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Value, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
VALUE (Millions of Dollars) TOTAL	$546.6	$668.1	$756.1	$836.6	$1,092.2	$1,191.5	$912.4	$411.2
Unit Value Under $1,000 (a)	18.0	20.7	28.3	28.6	31.7	25.7	14.8	7.2
Unit Value $ 1,000 and Over (b)	528.6	647.4	727.8	808.6	1,060.5	1,165.8	897.7	404.0
Broaching Machines								
Hydraulic	12.1	20.5	25.7	31.6	33.6	36.0	33.1	15.3
Mechanical and Other								
Planers, Shapers (Except Gear) and Slotters		D	D	(c)	(c)	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	1.5E	2.4E	2.2	3.4	3.4	3.2	3.4	5.2
Circular Cutoff Saws	12.6	9.9	7.6	10.6	11.6	22.2	11.0	8.7
Abrasive Cutoff Saws			3.5	3.1	4.7	5.5	3.5	2.4
Band Saws	27.6	32.0	32.1	43.6	50.9	56.8	40.9	23.6
Contour Sawing and Filing Machines	14.0E	D	D	18.4	20.5	24.0	25.8	18.2
All Other		12.0	9.9					
Tapping Machines	5.2	3.8	3.3	4.8	6.7	7.2	7.7	7.0
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool Change-Vert. & Horizontal	75.0	27.3	31.3	(f)	(f)	(f)	(f)	(f)
Indexing Turret								
Automatic Tool Change								
Vertical		54.4	71.8					
Horizontal	103.4	93.4	142.9					
Transfer Machines								
Dial or Rotary	223.0	318.9	322.5	29.9	80.0	70.1	47.9	25.5
Way Type				22.2	32.8	38.7	57.8	25.6
Station Type, Transfer				494.9	592.6	684.5	505.3	146.3
Other, N.E.C.				60.6	108.1	102.8	63.8	37.6
Electrical Discharge Machines (EDM)	17.2	19.0	29.0	45.7	78.1	66.9	41.2	42.4
Electrochemical Machines (ECM)	37.0(e)	37.5(d,e)	46.0(d,e)					
All Other Metal Cutting Machines				39.2	37.6	47.8	56.2	46.2

p - Preliminary. r - Revised. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 or over for 1978 to date.
(c) Included with "All Other".
(d) Excludes planers, which were reported as D.
(e) Includes threading machines.
(f) Beginning with 1979 there is a new classification for Machining Centers on the following page.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MACHINING CENTERS
Units and Value, 1979 to date

Products	1979	1980	1981	1982(r)	1983(p)
UNITS					
TOTAL	1,953	2,132	2,081	1,264	803
Unit Value over $2,500					
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	312	298	263	163	133
Drill, Mill, Bore-Vertical (Automatic Tool Change)					
Y-axis Travel Less Than 20 Inches	(a)	(a)	(a)	(a)	(a)
Y-axis Travel 20 Inches- 26 Inches	365	531	539	309	170
Y-axis Travel Over 26 Inches	188	238	280	147	91
Drill, Mill, Bore-Horizontal (Automatic Tool Change)					
Y-axis Travel Less Than 27 Inches	441	434	429	237	114
Y-axis Travel 27 Inches- 40 Inches	217	205	233	166	64
Y-axis Travel Over 40 Inches	123	138	127	107	36
All Other Machining Centers	307(b)	288(b)	210(b)	135(b)	195(b)
VALUE (Millions of Dollars)					
TOTAL	$356.5	$413.0	$482.7	$338.8	$166.3
Unit Value over $2,500					
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	30.8	32.1	32.4	22.4	18.5
Drill, Mill, Bore-Vertical (Automatic Tool Change)					
Y-axis Travel Less than 20 inches	(a)	(a)	(a)	(a)	(a)
Y-axis Travel 20 Inches- 26 inches	45.7	73.8	84.7	48.1	24.2
Y-axis Travel Over 26 inches	33.9	46.7	59.4	31.8	17.6
Drill, Mill, Bore-Horizontal (Automatic Tool Change)					
Y-axis Travel Less Than 27 inches	85.9	92.2	106.7	72.3	29.9
Y-axis Travel 27 Inches- 40 Inches	63.9	64.1	88.3	66.4	26.3
Y-axis Travel Over 40 Inches	69.5	75.9	80.8	79.7	27.2
All Other Machining Centers	26.8(b)	28.2(b)	30.4(b)	18.1(b)	22.6(b)

p - Preliminary. r - Revised.

(a) Included in All Other Machining Centers.

(b) This category includes Y axis Travel Less than 20", Machining centers with automatic multiple spindle head changing capability and all other machining centers.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
TOTAL	10,758	12,479	14,602	15,553	17,098	17,193	7,738	7,377
Unit Value Under $1,000(a)	D	D	D	1,693	1,640	1,349	921	1,189
Unit Value $1,000 and Over(b)	D	D	D	13,860	15,458	15,844	6,817	6,188
Knee Type Milling Machines (Except Bench)	D	10,365	11,872	13,216	14,852	15,275	6,498	5,951
Horizontal								
Plain								
Universal								
Vertical & All Other Knee Type								
Ram Type								
Bed Type Milling Machines	729E	644E	633					
Profile Machines and Duplicators	240	208	197	210	279	286	319	237
Die Sinking Machines	257E	D	D	229	327	283		
All Other Milling Machines	151	183	114	205				
VALUE (Millions of Dollars)								
TOTAL	$134.4	$160.2	$194.3	$279.8	$339.3	$436.6	$302.6	$186.9
Unit Value Under $1,000(a)	D	D	D	1.0	1.0	1.0	0.6	0.8
Unit Value $1,000 and Over(b)	D	D	D	278.9	338.3	435.6	302.0	186.1
Knee Type Milling Machines (Except Bench)	D	93.9	111.6	174.1	215.1	231.3	109.4	90.4
Horizontal								
Plain								
Universal								
Vertical and All Other Knee Types								
Ram Type								
Bed Type Milling Machines	17.3E	15.7E	28.9					
Profile Machines and Duplicators	18.4	18.5	14.9	66.9	96.8	157.3	192.6	95.7
Die Sinking Machines	1.5E	D	D	2.2	26.3	47.0		
All Other Milling Machines	25.9	30.6	36.1	35.7				

E - Estimate by NMTBA. p - Preliminary. r - Revised. D - Withheld to avoid disclosure.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and over for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1979 to Date
(Millions of Dollars)

Products	1979	1980	1981	1982(r)	1983(p)
UNITS					
TOTAL	15,553	17,098	17,193	7,738	7,377
All milling machines valued under $2,500	1,693	1,640	1,349	921	1,189
All milling machines valued at $2,500 and over	13,860	15,458	15,844	6,817	6,188
General-purpose, knee or bed:					
Horizontal plain, universal and ram	12,460	13,802	14,071	5,852	5,442
Vertical, except ram					
Vertical ram					
All other general-purpose type milling machines					
Automatic and manufacturing:					
Single spindle	425	483	356	217	162
Multiple spindle and special-purpose machines	331	567	848	429	347
Profile machines and duplicators	210	279	286	319	237
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	229	327			
All other milling machines N.E.C.	205		283		
VALUE (Millions of Dollars)					
TOTAL	$279.8	$339.3	$436.6	$302.6	$186.9
All milling machines valued under $2,500 each	1.0	1.0	1.0	0.6	0.8
All milling machines valued at $2,500 each or more:	278.8	338.3	435.6	302.0	186.1
General-purpose, knee or bed:					
Horizontal plain, universal and ram	135.1	155.8	140.1	64.8	64.0
Vertical, except ram					
Vertical ram					
All other general-purpose type milling machines					
Automatic and manufacturing:					
Single spindle	21.9	27.8	37.3	21.6	7.1
Multiple spindle and special-purpose machines	17.0	31.6	53.9	22.9	19.3
Profile machines and duplicators	66.9	96.8	157.3	192.6	95.7
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	2.2	26.3			
All other milling machines N.E.C.	35.7		47.0		

p - Preliminary. r - Revised.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
Units and Value, 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS TOTAL	58,118	64,566	69,813	82,199	75,336	66,666	45,884	47,840
Punching, Shearing, Bending and Forming	37,256	41,316	43,903	47,805	46,017	40,602	28,350	29,709
Punching and Shearing (a)	5,084	5,262	4,774	5,745	5,396	5,423	3,513	2,529
Bending and Forming (a)	8,419	11,796	10,398	9,791	9,242	7,472	5,768	5,631
Presses, Including Forging(b)	14,302	16,194	16,655	24,418	20,428	18,030	11,610	9,452
Presses, Including Forging (a,b)	NA	9,654	NA	7,432	5,764	4,123	2,992	2,206
Other Metal Forming Machine Tools	6,560	7,056	9,255	9,976	8,891	8,034	5,924	8,679
VALUE (Millions of Dollars) TOTAL	$586.0	$662.1	$808.2	$1,026.8	$1,096.0	$1,064.3	$826.7	$547.7
Punching, Shearing, Bending and Forming	238.8	267.9	294.3	364.6	419.1	418.9	295.8	249.7
Punching and Shearing(a)	117.4	128.2	141.3	174.3	196.7	198.1	132.2	110.8
Bending and Forming(a)	12.4	130.9	139.0	171.2	202.6	200.5	148.7	122.3
Presses, Including Forging(b)	223.6	260.7	350.9	434.0	440.8	429.6	338.7	149.2
Presses, Including Forging(a,b)	NA	257.9	NA	422.1	429.9	418.6	332.2	144.5
Other Metal Forming Machine Tools	123.6	133.6	163.7	228.2	236.1	215.8	192.2	148.8

p - Preliminary. NA - Not Available. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or more beginning in 1978. (Machine tools under $1,000 for 1974-1977 and under $2,500 for 1978 are not included so the individual items do not add to the totals.)

(b) Excludes Forging for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF HYDRAULIC AND PNEUMATIC METALWORKING PRESSES
Units and Value (a), 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	NA	NA	NA	87	78	39	49	27
Column Type	203	170	174	433	443	347	268	141
Open Rod Type	305E	348	392	(b)	(b)	(b)	(b)	(b)
Gap or C-Frame	843	1,667	673					
15 Tons and Under				571	546	483	449	333
16-35 Tons				58	63	55	96	
Over 35 Tons				166	140	98		
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses	D	D	D	34	1,137(c)	702(c)	533(c)	D
All Other Hydraulic Presses	1,789(c)	1,611(c)	1,363(c)	1,871(c)				
VALUE (Millions of Dollars)								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	NA	NA	NA	$ 18.7	$ 16.7	$ 16.3	$28.5	$10.9
Column Type	$ 5.3	$ 4.8	$ 16.2	9.2	11.7	8.5	7.3	7.4
Open Rod Type	6.1E	8.7	9.4	(b)	(b)	(b)	(b)	(b)
Gap or C-Frame	3.5	8.0	7.4					
15 Ton and Under				4.9	5.2	4.6	9.2	4.2
16-35 Tons				1.3	1.5	1.6	4.7	
Over 35 Tons				7.8	6.7	4.9		
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses	D	D	D	12.8	45.8(c)	50.0(c)	52.2(c)	D
All Other Hydraulic Presses	11.1(c)	17.3(c)	32.1(c)	30.7(c)				

p - Preliminary. D - Withheld to avoid disclosure. r - Revised. E - Estimate by NMTBA. NA - Not Available.

(a) Average value $1,000 or over through 1977, $2,500 or over beginning in 1978.
(b) Data included with "All Other Hydraulic Presses."
(c) Includes horizontal.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

SHIPMENTS OF MECHANICAL PRESSES

Units and Value (a), 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
Open Inclinable Gap Type								
50 Tons and Under	3,598	3,373	2,140	1,374	954	642	433	435
51 Tons to 120 Tons	653	898	929	1,000	717	444	255	205
120 Tons and Over				96	103	87	D	D
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	78	D	68E	59	57	90	D	D
201 to 300 Tons								
301 Tons and Over								
Two Point								
300 Tons and Under	206	292	285	313	244	154	137	D
301 Tons and Over	63	66	116	97	77	46		
Four Point	D	D	D	(b)	(b)	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	188	167	228	622	575	389	245	254
51 Tons and Over	348E	D	D					
Knuckle Joint	D	D	D	(b)	(b)	(b)	(b)	(b)
Horizontal								
Gap and Horn Type	338	386	306	322	352	242	162	52
Bulldozers and Transfer Feed Presses	98	133	97	329	278	305	296	103
All Other Mechanical Presses								
VALUE (Millions of Dollars)								
Open Inclinable Gap Type								
50 Tons and Under	$13.2	$16.2	$16.0	$20.0	$15.9	$13.4	$9.6	$7.8
51 Tons to 120 Tons	17.5	27.2	29.3	32.4	27.5	19.1	11.0	8.0
120 Tons and Over				6.4	7.6	8.0	D	D
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	17.7	D	12.8E	13.9	13.2	20.7	D	D
201 to 300 Tons								
301 Tons and Over								
Two Point								
300 Tons and Under	15.8	27.4	24.3	26.7	31.3	25.5	43.1	D
301 Tons and Over	19.4	23.1	41.8	43.5	48.1	39.4		
Four Point	D	D	D	(b)	(b)	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	9.5	9.9	13.4	76.5	83.7	72.2	44.6	32.9
51 Tons and Over	36.5E	D	D					
Knuckle Joint	D	D	D	(b)	(b)	(b)	(b)	(b)
Horizontal								
Gap and Horn Type	6.2	7.1	9.7	9.2	10.0	5.6	4.5	2.1
Bulldozers and Transfer Feed Presses	12.1	22.1	30.5	108.1	104.9	129.0	103.3	21.2
All Other Mechanical Presses								

p - Preliminary. E - Estimate by NMTBA. D - Withheld to avoid disclosure. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.

(b) Included with "All Other Mechanical Presses".

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF PUNCHING, SHEARING, BENDING AND FORMING MACHINES
Units and Value (a), 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	1,790	1,653	1,575	2,387	2,300	2,512	1,663	933
Punching Machines, Fixed Position & Two Axes Positioning Table	853	767	768	938	822	678	407	392
Plate Shearing Machines	1,332	1,254	1,318	1,618	1,481	1,352	926	799
Bar and Angle, and Rotary Shearing Machines	179	234	339	275	186	186	152	133
Other Power Operated Punching and Shearing Machines	546	507	551	527	607	695	365	272
Manually Operated Punching and Shearing Machines	384	847	223					
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	483	450	417	657	503	409	262	260
Bending Rolls, Angles, Bars and Shapes (Power)	1,440	1,548	1,847		231	300	116	92
Press Brakes and Folders (Power)(d)				(b)	(b)	(b)	(b)	(b)
Mechanical				588	824	548	335	381
Hydraulic				856	1,540	904	612	599
Hydro-Mechanical				622		350	262	168
Rotary Bending and Forming (Power)	2,453	3,523	2,334	1,655	1,275	1,200	1,051	1,497
Rotary Head and Ram Bending (Power)			1,588	1,487(c)	1,287(c)	1,017(c)	766(c)	285(c)
Other Bending and Forming Machines, or (Power or Manual)	4,043	6,275	4,202	3,926	3,582	2,744	2,364	2,349
VALUE (Millions of Dollars)								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	$15.7	$15.4	$14.0	$20.8	$21.7	$26.0	$17.2	$12.9
Punching Machines, Fixed Position & Two Axes Positioning Table	44.6	54.2	64.6	81.4	95.1	84.8	45.7	48.5
Plate Shearing Machines	44.1	44.3	46.6	53.6	61.0	65.9	55.1	40.8
Bar and Angle, and Rotary Shearing Machines	3.5	2.4	2.6	3.3	1.6	3.0	1.8	2.0
Other Power Operated Punching and Shearing Machines	8.7	10.1	13.0	15.2	17.4	18.3	12.3	6.6
Manually Operated Punching and Shearing Machines	.8	1.8	.6					
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	9.7	9.4	9.4	34.1	24.2	25.7	13.9	5.8
Bending Rolls, Angles, Bars and Shapes (Power)	39.6	43.6	52.9		13.1	15.9	13.3	12.1
Press Brakes and Folders (Power)(d)				(b)	(b)	(b)	(b)	(b)
Mechanical				10.8	15.2	12.5	6.3	9.1
Hydraulic				30.0	50.8	40.7	28.0	20.3
Hydro-Mechanical				10.0		9.1	5.8	5.3
Rotary Bending and Forming (Power)	27.2	26.5	19.7	19.3	26.4	23.6	24.4	23.5
Rotary Head and Ram Bending (Power)			14.9	16.1(c)	14.3(c)	15.1(c)	9.5(c)	6.3(c)
Other Bending and Forming Machines, or (Power or Manual)	35.9	51.4	42.1	51.0	58.6	57.9	47.6	39.9

D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977, $2,500 or over beginning in 1978.
(b) Folders included in Other.
(c) Ram and Press Bending Only. Rotary Head is a part of Rotary Bending and Forming.
(d) The detail for press brakes is not available prior to 1979.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF FORGING AND OTHER METAL FORMING MACHINE TOOLS

Units and Value (a), 1976 to Date

Products	1976	1977	1978	1979	1980	1981	1982(r)	1983(p)
UNITS								
Forging Machines(Except Presses)(b)	545	494	533	609	631	479	379	286
Riveting Machines (Except Portables)	2,707	2,969	3,346	3,246	2,025	1,764	1,320	1,592
Thread Rolling Machinery	212	203	232	233	202	150	111	80
Die Casting Machines								
Under 500 Tons	NA	NA	NA	90	123	112	75	101
501 Tons and Over	NA	NA	NA	136	94	56	31	
Spinning Lathes Marking Machines, Knurling Machines	D	D	D	2,851	2,766	2,326	1,873	1,791
Electroforming & Others Metal Container Making Machines	1,922	2,160	2,568				642	622
VALUE (Millions of Dollars)								
Forging Machines (Except Presses)(b)	$52.2	$51.1	$59.3	$84.7	$73.8	$79.0	$78.8	$46.3
Riveting Machines (Except Portables)	13.0	14.6	13.7	15.8	21.9	24.3	14.6	12.7
Thread Rolling Machinery	6.3	7.1	8.3	9.4	6.9	8.5	7.2	5.0
Die Casting Machines								
Under 500 Tons	NA	NA	NA	7.6	12.4	11.5	8.0	18.2
501 Tons and Over	NA	NA	NA	30.9	27.1	15.1	8.7	
Spinning Lathes Marking Machines, Knurling Machines	D	D	D	75.3	88.0	73.1	44.9	35.6
Electroforming & Others Metal Container Making Machines	49.2	52.3	72.1				27.6	26.6

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.

(b) Includes forging presses for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

INDUSTRIES MANUFACTURING MACHINE TOOLS
Value of Shipments, by Industry, by Type, 1972 and 1977
(Millions of Dollars)

	All Industries		Shipped by					
			Metal Cutting Machine Tool Industry	Metal Forming Machine Tool Industry	Special Dies, Tools, Jigs, & Fixtures Industry	Machine Tool Accessories Industry	Metal Working Machinery N.E.C. Industry	Other Industries
			SIC 3541	SIC 3542	SIC 3544	SIC 3545	SIC 3549	
	1972	1977	1977					
Metal Cutting Machine Tools								
Total	$1,259	$2,561	$2,354	$31	$14	$48	$ D	$102
Boring Machines	59	94	90	—	D	D	D	D
Drilling Machines	74	109	103	—	—	D	D	D
Gear Cutting & Finishing	57	67	53	D	—	D	—	D
Grinding & Polishing	169	288	244	D	—	D	D	29
Lathes	198	456	447	D	—	D	D	6
Milling Machines	87	168	150	12	—	—	D	D
Other Machine Tools (a)	303	714	660	(d)	D	10	D	22
Parts Sold Separately (b)	242	502	461	8	D	8	D	20
Not Specified	71	163	146	(c)	8	3	(c)	5
Metal Forming Machine Tools								
Total	$670	$1,115	$35	$967	$ 2	$ 4	$ 4	$103
Punching, Shearing, Bending, and Forming Machines	153	280	5	257	D	D	D	D
Presses, incl. Forging Presses	183	283	D	241	—	D	D	D
Other Metal Forming Tools	149	172	D	140	D	D	D	D
Parts & Rebuilt Machines	162	296	15	244	D	D	2	D
Not Specified	23	85	--	84	—	—	—	(c)

D - Witheld to avoid disclosure. N.E.C. - Not elsewhere classified.

(a) Includes machine tools for home workshops, laboratories, etc.
(b) Includes rebuilt machine tools.
(c) Under $2 million.
(d) Over $2 million.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977; MC77(2)-35C" and earlier issues.

Machine tools are "primary products" of the metal cutting and metal forming machine tool industries (SIC 3541 and 3542). However, other industries also manufacture machine tools as "secondary products". In turn, the machine tool industry produces some products other than machine tools.

MILITARY PRIME CONTRACT AWARDS FOR MACHINE TOOLS

Fiscal Years 1980 to Date

(Thousands of Dollars)

	Year ending June 30			
	1980	1981	1982	1983
Saws and filing machines	$ 2,115	$ 2,142	$2,339	$2,055
Machining centers and way type machines	2,883	4,155	10,035	14,981
Electrical and ultrasonic erosion machines	499	382	801	1,169
Boring machines	6,640	3,414	7,741	4,527
Broaching machines	38	839	12	5,000
Drilling machines and tapping machines	1,413	1,372	8,556	2,247
Gear cutting and finishing machines	-40	163	151	661
Grinding machines	9,969	17,681	7,336	8,836
Lathes	24,032	23,645	15,003	22,220
Milling machines	11,252	12,248	9,805	11,963
Planers and shapers	183	400	908	123
Miscel. machine tools	115,512	27,594	4,416	5,799
Total metal cutting machine tools	$174,496	$ 94,035	$67,103	$79,581
Bending and forming machines	$ 3,662	$ 2,524	$5,338	$4,022
Hydraulic and pneumatic presses	952	2,102	1,938	1,931
Mechanical presses, power driven	299	755	761	1,213
Manual presses	156	430	476	474
Punching and shearing machines	2,521	4,342	3,653	3,288
Forging machinery and hammers	214	398	1,041	2,616
Wire and metal ribbon forming machines	42	474	42	80
Riveting machines	117	151	220	46
Miscel. secondary forming & cutting mach.	32,688	128,578	-48,489	-45,108
Total metal forming machine tools	$ 40,651	$139,754	$-35,020	$-31,438
Total Machine Tools	$215,147	$233,789	$32,083	$48,143

Source: Department of Defense, OASD (Comptroller), "Military Prime Contract Awards, by Service Category and Federal Supply Classification."

5

U. S. MACHINE TOOL FOREIGN TRADE

Foreign trade in machine tools has been a fact of life in the world's metalworking markets since the beginning of the industrial era. As a preeminent producer, the U.S. machine tool industry has historically exported around 15% of its annual output. However, in recent years the U.S. industry's position as an export leader has been challenged by competitors from other industrial nations and from developing nations. As a result of the combined effects of the increased competition, the worldwide recession of the past several years, and the extremely high value of the dollar relative to other currencies, U.S. machine tool exports have declined significantly since 1981. Imported foreign machine tools, on the other hand, have continued to increase their penetration of the U.S. market.

After having peaked at a value of over $1 billion in 1981, U.S. exports of machine tools fell to $615 million in 1982 and fell again to $406 million in 1983. Imports also declined during this time period, but by a much smaller proportion. After registering a record high of $1.49 billion in 1981, imports fell to $1.25 billion in 1982 and declined again to $946 million in 1983. However, since shipments of U.S. built machine tools fell far more rapidly than either imports or exports, the share of domestic market taken by imports continued to climb. From a level of 25% in 1981, the import market share had risen to 33% by 1983.

Similarly, the machine tool trade deficit remained significant. At a record $635 million for 1982 and a slightly lower $540 million for 1983, the deficits for both years exceeded the total value of U.S. machine tool exports for the first time in the industry's history. These deficits underscore the importance of international trade to the machine tool industry and bring into focus the reality of the world marketplace. Reestablishing its position in this world market is vital to the future of the U.S. machine tool industry.

United States Foreign Trade Statistics

The most widely used data on foreign trade are the Census Bureau reports on exports and imports. Exports and imports are compiled from copies of the shipper's own declaration filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Freight, insurance, and other charges are included, thus giving exports a value higher than that of the machine tool at the manufacturer's plant.

The Census data include shipments by manufacturers and by others such as dealers and distributors. They also include exports of rebuilt machine tools, replacement parts, and machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking.

While the Census export figures tend to show a value higher than the value of the machines at the manufacturer's plant, import figures show values considerably lower than those paid by the purchaser of foreign machine tools. Values are, in general, based on the market value or price, in the foreign country at the time of exportation and include the cost of containers and coverings as well as other charges and expenses incidental to placing the merchandise into condition for shipment to the United States. However, they exclude import duties, insurance, ocean freight, and other charges incidental to the arrival of the goods in the United States.

As a result of these and other factors inflating the "value" of the exports and deflating the "value" of the imports, the impact of imports is greater than that shown in most tables in this chapter. The negative balance of trade, correspondingly, is larger than shown.

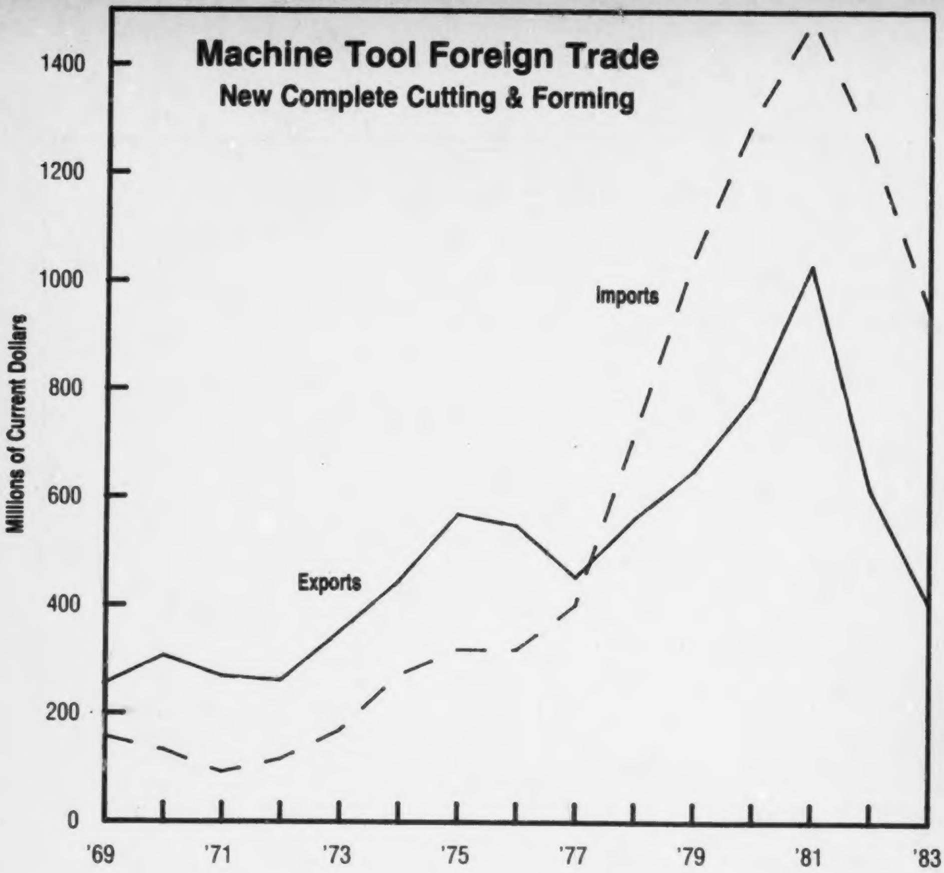
There are two additional export series with a more limited scope but considered more accurate by the industry.

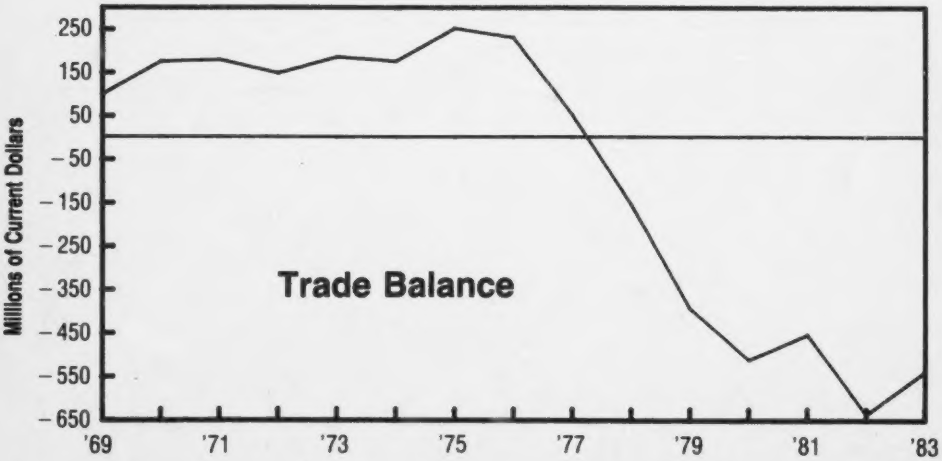
The first is a series on foreign orders and shipments that is part of the NMTBA "Industry Estimates of New Orders, Cancellations, Shipments, and Backlog," published monthly for the entire industry (see Chapter 4 for details on this report).

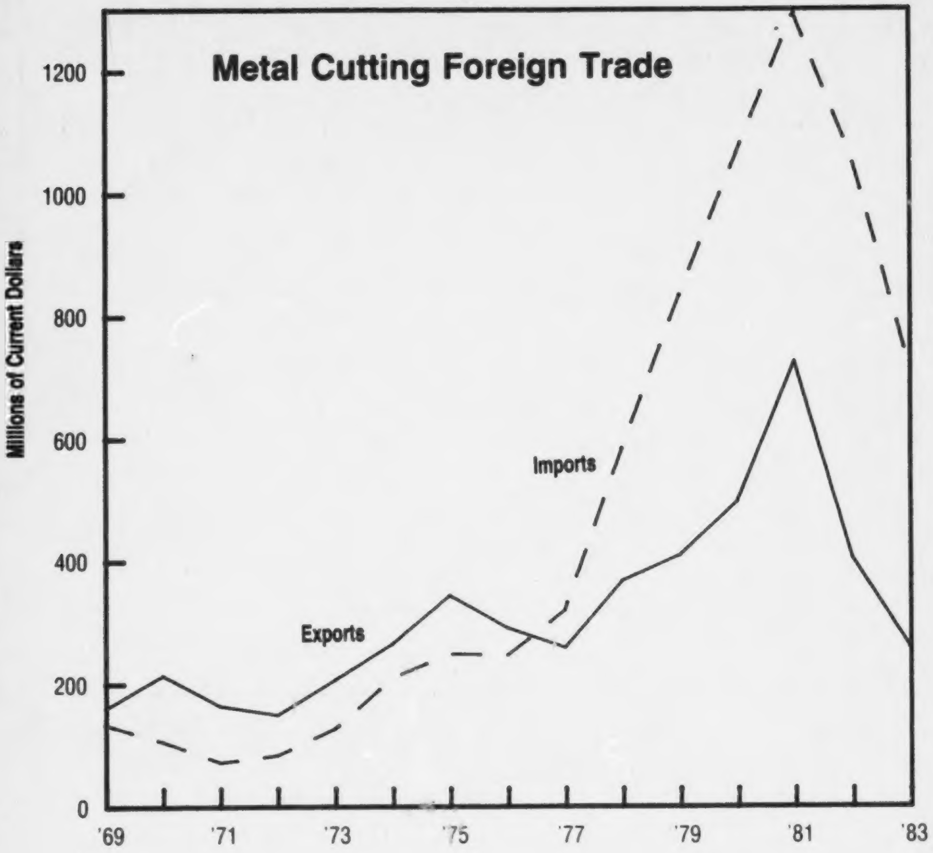
The other is the series on exports, based on manufacturers' shipments for export, published in the MQ-35W series by the Department of Commerce (see Chapter 4 for details). This report shows manufacturers' shipments of new and complete machine tools for 12 major machine tool categories. It also shows the historical quantity and value of exports for about 15 selected types of machine tools through 1972, but only the value of exports from 1973 forward.

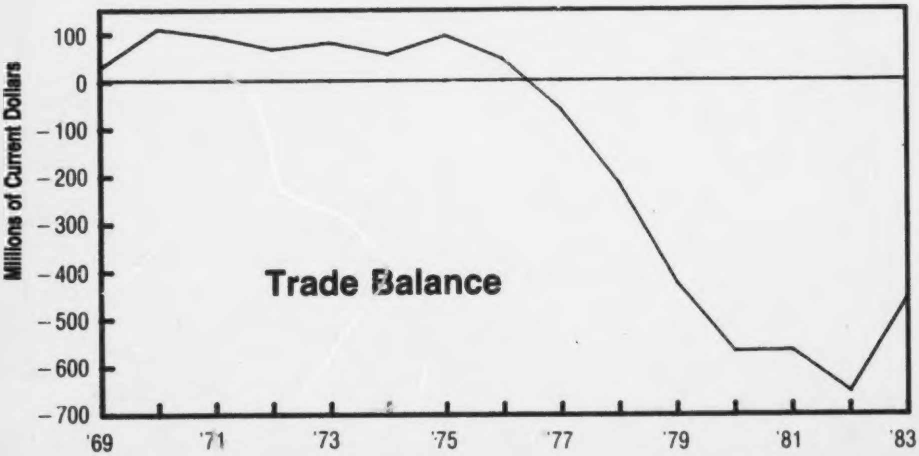
The two major reasons the Census data are the most widely used in spite of their shortcomings are that (1) the Census series on imports is the only one available, and (2) the two Census series on ports and imports include a similar broad "universe" (new, used, and rebuilt machines and home-workshop type machine tools).

Beginning with 1980 data, the commodity descriptions and classification numbers for machine tools were revised. Although the machine tool categories differ slightly, the resulting TSUSA import and Schedule B export classification codes are comparable and permit direct comparisons of foreign trade by product types. Foreign trade data are also comparable to U.S. production data (MQ-35W, see Chapter 4), permitting the calculation of U.S. consumption of machine tools for a variety of product types.


Machine Tool Foreign Trade
New Complete Cutting & Forming
Millions of Current Dollars
1400
1200
1000
800
600
400
200
0
Imports
Exports
'69
'71
'73
'75
'77
'79
'81
'83


Trade Balance
Millions of Current Dollars
250
150
50
−50
−150
−250
−350
−450
−550
−650
'69
'71
'73
'75
'77
'79
'81
'83


Metal Cutting Foreign Trade
Millions of Current Dollars
1200
1000
800
600
400
200
0
Imports
Exports
'69
'71
'73
'75
'77
'79
'81
'83


Trade Balance
Millions of Current Dollars
100
0
– 100
– 200
– 300
– 400
– 500
– 600
– 700
'69
'71
'73
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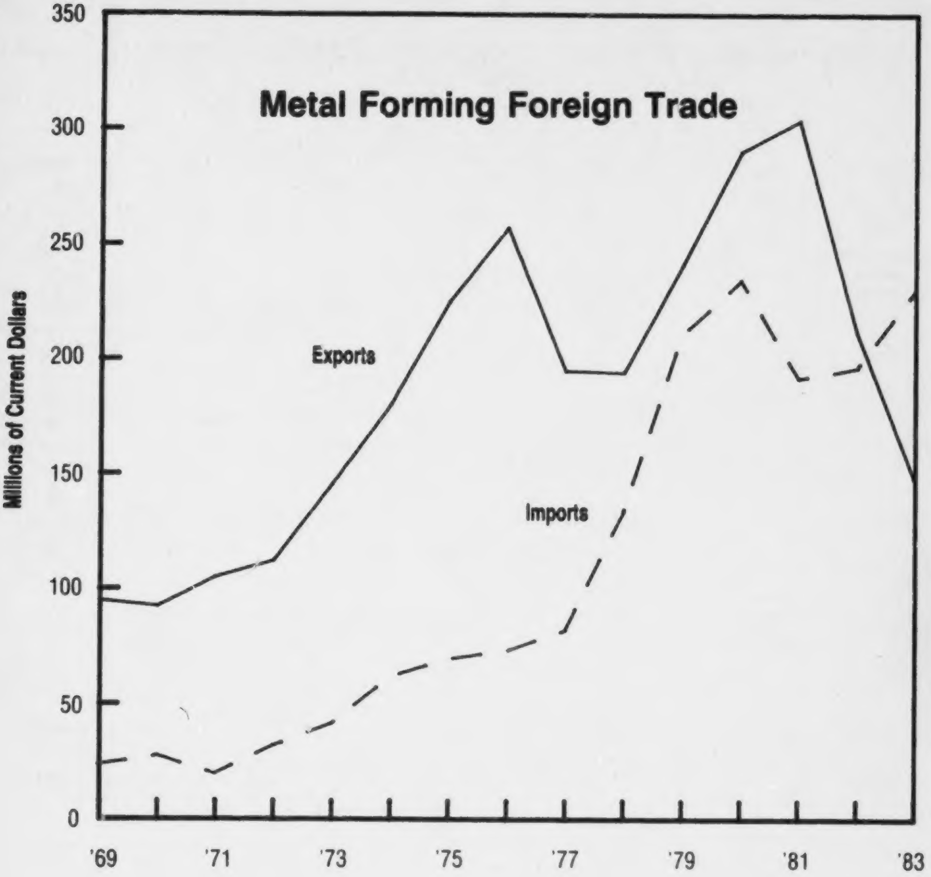
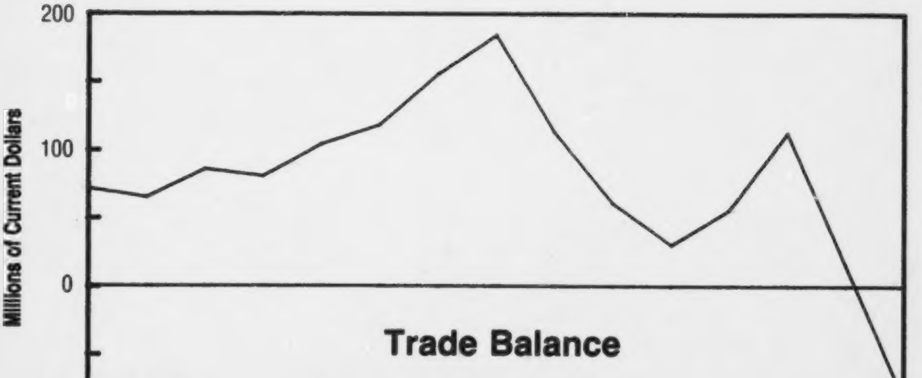
'77
'79
'81
'83



Metal Forming Foreign Trade



Trade Balance

U.S. MACHINE TOOL IMPORTS AS A PERCENTAGE OF U.S. MACHINE TOOL CONSUMPTION(r)

By Type of Complete Machines Valued Over $2,500 (a), 1975 to Date

	1975	1976	1977	1978	1979	1980	1981	1982	1983
Machine Tools	14.8	16.4	16.8	20.6	22.6	23.3	24.9	26.8	32.5
Metal Cutting	14.8	16.1	17.5	21.6	23.0	23.6	26.1	27.6	31.5
Boring Machines	29.1	28.6	34.2	39.3	26.0	25.0	29.3	25.2	29.6
Drilling Machines	12.4	17.2	19.8	13.8	18.8	17.7	21.7	22.2	20.0
Gearcutting Machines	38.1	35.8	28.8	31.7	32.9	29.8	31.1	28.1	36.7
Lathes	17.5	19.1	24.0	33.1	37.3	36.0	41.3	44.9	36.6
Milling Machines	17.1	17.8	16.8	22.6	24.5	30.2	23.9	23.9	23.4
Machining Centers	NA	NA	NA	NA	11.3	20.8	31.3	38.3	51.9
Metal Forming	14.9	17.8	14.7	17.4	21.1	22.1	19.4	23.6	35.5

NA - Not Available. r - Revised.

(a) Based on shipments of complete machine tools with values greater than $1,000 for 1975–1977 and $2,500 for 1978 to date.

Sources: U.S. Dept. of Commerce: "Current Industrial Reports, Series MQ-35W, Metalworking Machinery", and U.S. Bureau of the Census, "IM 146" and "EM 522".

UNITED STATES PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF NEW COMPLETE MACHINE TOOLS(a,r), 1958 to Date

(Thousands of Dollars)

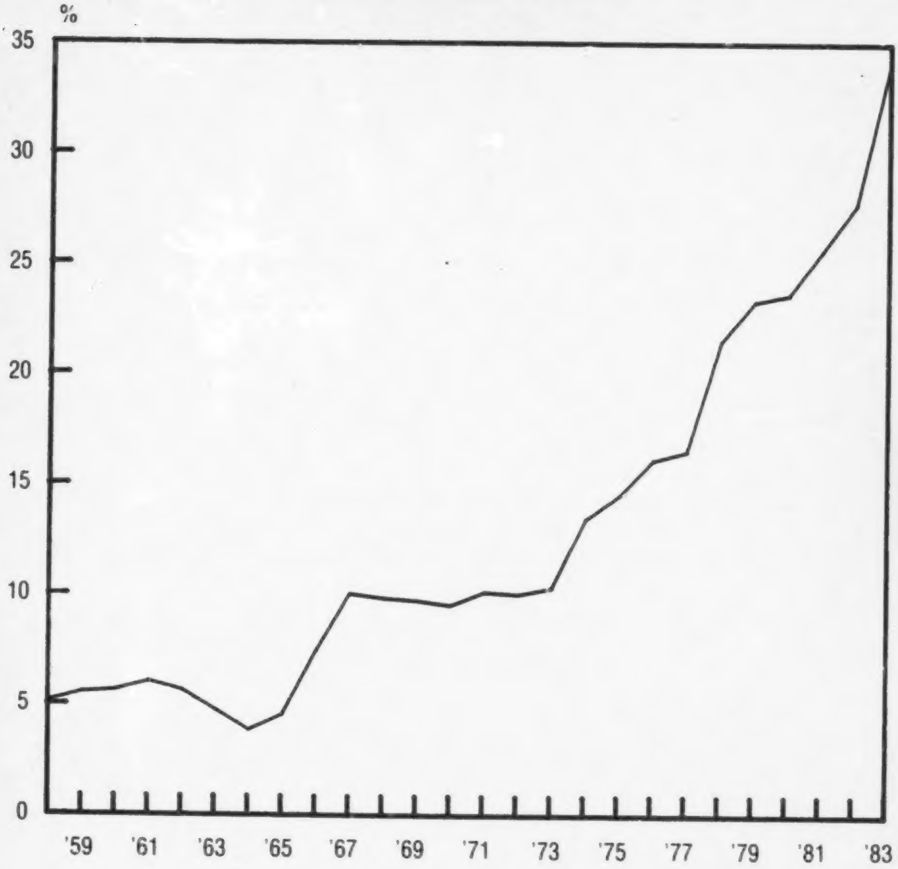
Year	Production	Exports	Imports	Domestic Consumption
1958	$654,387	$127,608	$28,105	$554,884
1959	668,952	114,271	32,461	587,142
1960	762,457	164,094	35,656	634,019
1961	751,626	239,635	32,424	544,415
1962	857,334	266,992	34,660	625,002
1963	946,083	185,443	37,679	798,319
1964	1,185,380	254,511	36,364	967,233
1965	1,429,650	222,437	56,293	1,263,506
1966	1,680,014	208,909	117,748	1,588,853
1967	1,826,432	224,672	178,205	1,779,965
1968	1,722,727	216,552	163,576	1,669,751
1969	1,692,188	242,427	156,122	1,605,883
1970	1,551,777	292,086	131,826	1,391,517
1971	1,057,870	251,532	90,085	896,423
1972	1,269,302	238,135	113,998	1,145,165
1973	1,787,850	325,494	167,057	1,629,413
1974	2,165,937	410,510	270,740	2,026,167
1975	2,406,082	536,659	317,578	2,187,001
1976	2,178,265	514,942	318,304	1,981,627
1977	2,453,423	426,729	400,904	2,427,598
1978	3,142,594	533,094	715,282	3,324,782
1979	4,064,045	619,111	1,043,768	4,488,702
1980	4,812,349	734,135	1,259,802	5,338,016
1981	5,111,253	949,553	1,431,457	5,593,157
1982	3,748,911	574,567	1,217,718	4,392,062
1983(p)	2,132,649	359,037	921,083	2,694,695

p - Preliminary. r - Revised.

(a) - Production figures are those reported by domestic manufacturers in the MQ-35W. Import and export figures are taken from the Department of Commerce's "IM146" and "EM 522" report. These figures reflect data for machine tools of all values but does not include the value of used and rebuilt machines.

Source: NMTBA, "Current Industrial Reports; Metalworking Series, MQ-35W", U.S. Department of Commerce Trade Statistics.

U.S. Machine Tool Imports as a Percentage of U.S. Machine Tool Consumption



The government import statistics used on this and the previous page represent machine tool values in the originating foreign country. They exclude import duties, freight insurance and other charges incurred in bringing the machines to the United States and thus understate the imports' actual cost. A conservative adjustment reflecting these value-adding charges results in a slightly higher proportion of U.S. consumption being accounted for by imports. For example, the adjusted 1982 import share of U.S. machine tool consumption was 32.3% as compared with an unadjusted share of 26.8%.

U.S. IMPORTS OF MACHINE TOOLS (a)
Major Countries of Origin, 1972 to Date

(Millions of Dollars)

Country of Origin	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
TOTAL	$114.0	$167.1	$270.7	$317.6	$318.3	$400.9	$715.3	$1,043.8	$1,298.5	$1,482.9	$1,253.3	$946.5
Austria	1.3	.9	1.8	3.2	2.0	1.0	2.3	3.7	2.3	2.1	15.8	30.0
Belgium	1.8	1.5	5.3	6.4	3.1	4.9	8.0	12.6	16.7	18.5	9.1	7.1
Czechoslovakia	1.8	1.1	2.6	2.8	3.5	2.9	3.9	4.6	5.7	4.7	2.0	.6
Denmark	.8	.7	1.4	1.1	1.0	.7	2.5	3.3	3.7	2.9	2.2	2.8
France	3.0	9.9	13.4	16.2	9.5	9.7	17.4	21.4	24.9	26.5	12.9	10.5
Germany (East)	.3	.3	.3	.6	.8	.7	1.8	1.9	2.0	2.9	3.1	2.1
Germany (West)	39.2	51.6	78.0	96.0	93.3	91.2	154.8	197.0	235.9	192.3	204.6	125.7
Italy	7.6	10.1	16.8	15.5	14.6	15.1	25.4	37.5	44.1	42.9	45.0	49.3
Netherlands	1.1	1.7	2.4	1.3	1.1	1.9	2.7	5.5	6.1	4.9	2.6	5.7
Norway	.3	.3	.6	.4	.1	.6	.4	.6	.3	.8	1.0	.1
Poland	.5	1.7	5.2	2.2	2.8	7.2	12.8	19.2	15.6	15.8	7.5	2.1
Spain	2.5	4.2	6.8	6.4	6.9	7.7	13.4	20.6	27.1	24.3	20.6	11.6
Sweden	3.0	5.5	8.9	9.9	8.4	11.5	18.3	31.3	29.3	28.3	23.4	15.3
Switzerland	11.8	20.0	29.3	27.0	28.6	35.3	57.6	66.0	81.5	78.4	71.8	54.7
United Kingdom	15.0	21.9	31.0	39.3	32.0	46.1	74.9	96.9	117.3	136.1	107.5	66.4
Canada	7.0	9.5	12.7	15.0	14.9	19.2	27.0	34.2	47.9	44.0	36.6	29.4
Japan	14.7	22.0	47.4	62.6	67.3	105.7	220.6	353.3	492.0	687.5	529.2	414.9
Taiwan	.2	.8	2.4	2.7	13.0	22.6	48.8	85.7	93.6	102.4	90.9	83.4
Other Countries	2.0	3.3	4.4	8.8	15.4	16.9	22.5	48.5	52.5	67.6	67.5	34.8

(a) Data does not include parts, but does include "Used and Rebuilt."

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.

U.S. IMPORTS OF CUTTING AND FORMING MACHINE TOOLS (b)

Major Countries of Origin, 1972 to Date

(Millions of Dollars)

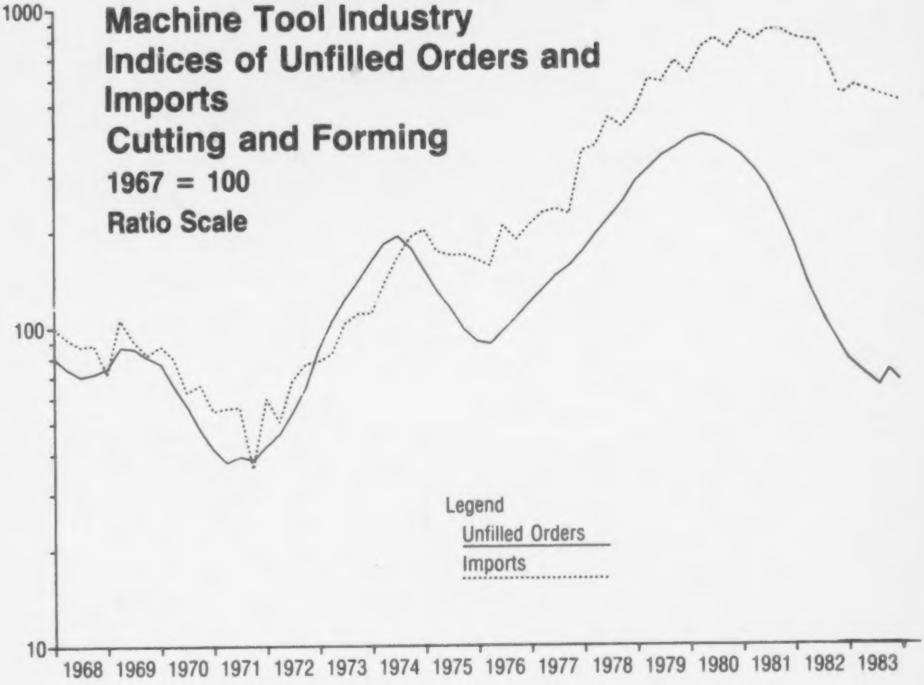
Country of Origin	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
CUTTING												
TOTAL	$82.5	$126.0	$209.1	$248.1	$245.3	$319.2	$582.2	$833.1	$1,064.4	$1,291.5	$1,057.4	$716.9
Austria	.7	.7	1.3	1.6	1.9	1.0	1.8	2.6	1.4	2.0	3.1	4.2
Belgium	.6	.8	1.7	2.6	1.2	4.3	4.5	6.2	8.0	10.8	5.6	3.0
Czechoslovakia	1.8	1.1	2.6	2.8	3.5	2.9	3.9	4.4	5.5	4.6	2.0	.6
Denmark	.4	.4	.7	.6	.9	.5	1.8	1.5	2.4	1.3	1.2	1.4
France	2.4	8.7	11.6	14.9	7.8	9.7	13.8	17.5	22.3	20.6	9.3	6.6
Germany (East)	.3	.3	.3	.6	.7	.7	1.6	1.8	1.9	2.9	3.1	2.0
Germany (West)	23.7	35.3	53.0	69.0	59.7	60.3	104.0	117.0	150.2	148.4	155.0	91.6
Italy	5.9	6.9	11.6	11.3	11.3	11.1	19.6	23.9	34.2	31.6	36.5	21.4
Netherlands	.9	1.3	1.9	1.0	1.0	1.0	2.4	4.3	5.4	4.3	2.1	2.6
Poland	.5	1.7	5.0	2.2	2.8	7.2	12.6	19.1	15.5	15.8	7.5	2.0
Spain	2.4	4.0	6.4	6.0	6.2	7.3	13.0	18.9	24.3	21.9	19.0	9.5
Sweden	2.5	4.7	7.8	7.5	7.0	9.6	12.9	21.7	19.9	19.9	14.9	7.7
Switzerland	9.2	14.3	23.1	20.9	22.5	28.1	47.7	53.9	65.9	65.4	61.1	40.5
United Kingdom	11.2	117.1	26.6	34.2	27.8	39.2	64.0	86.7	103.8	120.5	94.1	56.6
Canada	4.6	5.7	7.7	8.5	8.9	11.0	16.2	18.1	29.1	28.2	22.4	12.7
Japan	13.4	19.1	41.0	53.1	54.8	89.1	193.7	305.9	433.4	627.4	467.8	340.0
Taiwan	.2	.8	2.4	2.7	12.8	22.5	47.9	85.3	93.1	101.6	89.9	82.4
Other Countries	1.8	3.0	3.9	8.6	14.5	13.7	20.6	44.3	48.1	64.3	62.8	31.9
FORMING												
TOTAL	$31.4	$41.1	$61.6	$69.4	$73.0	$81.7	$133.1	$210.7	$234.1	$191.4	$196.0	$229.5
Austria	.6	.2	.5	1.6	.1	(a)	.5	1.1	.9	.1	12.8	25.7
Belgium	1.2	.7	3.6	3.8	1.9	.5	3.5	6.4	8.7	7.7	3.5	4.1
Germany (West)	15.5	16.3	25.0	27.0	33.6	30.9	50.7	80.1	85.7	44.0	49.6	34.1
France	.7	1.2	1.8	1.4	1.7	2.4	3.6	4.0	2.5	5.9	3.6	3.9
Italy	1.7	3.2	5.2	4.2	3.2	4.0	5.8	13.6	9.9	11.3	8.6	27.9
Sweden	.6	.8	1.1	2.4	1.4	2.0	5.4	9.6	9.3	8.3	8.5	7.6
Switzerland	2.6	5.7	6.3	6.1	6.2	7.2	9.9	12.1	15.7	13.0	10.7	14.2
United Kingdom	3.7	4.8	4.4	5.1	4.2	6.9	10.9	10.2	13.6	15.6	13.5	9.8
Canada	2.4	3.8	5.0	6.5	6.0	8.3	.3	16.1	18.8	15.8	14.2	16.7
Japan	1.3	2.9	6.4	9.5	12.5	16.6	26.9	47.4	58.6	60.1	61.5	74.9
Other Countries	1.1	1.4	.5	1.8	2.2	2.9	15.6	10.1	10.4	9.6	9.5	10.6

(a) Less than $50,000; included in "Other Countries."

(b) Data does not include parts. See previous page.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.



Machine Tool Industry
Indices of Unfilled Orders and Imports
Cutting and Forming
1967 = 100
Ratio Scale

UNITED STATES IMPORTS OF MACHINE TOOLS AND PARTS

By Machine Classification, 1972 to Date

(Millions of Dollars)

Machine Classification	1972	1973	1974	1975	1976	1977	1978	1979	1980r	1981r	1982	1983
GRAND TOTAL	$141.8	$211.6	$330.3	$382.4	$383.3	$482.2	$832.4	$1,269.5	$1,556.9	$1,712.9	$1,489.4	$1,100.2
METAL CUTTING	104.3	164.6	261.3	303.0	293.6	386.7	681.6	1,027.6	1,282.2	1485.1	1,258.1	836.9
Complete Machines	82.5	126.0	209.1	248.1	245.3	319.2	582.2	833.1	1,029.2	1245.6	1,057.4	716.9
Gear Cutting or Hobbing	4.5	4.7	10.7	20.7	16.9	13.5	25.9	28.4	29.4	37.0	25.8	13.8
Drilling	4.3	5.6	8.8	9.4	15.3	19.6	18.7	25.0	27.2	26.4	20.7	9.9
Milling	7.5	12.4	19.8	23.3	25.9	27.9	47.7	83.1	138.1	124.7	87.7	52.5
Machining Centers	(a)	(a)	(a)	(a)	(a)	(a)	22.0	39.6	93.4	195.7	188.9	164.9
Boring and Vertical Turret Lathes	13.6	14.4	28.8	41.1	41.0	51.8	65.9	70.7	76.9	86.7	78.8	44.6
Lathes (Exc. Vertical Turret Lathes)	22.9	45.7	73.1	77.0	77.0	113.9	219.4	353.6	380.0	479.8	338.6	165.7
Grinding	12.7	20.0	32.4	34.5	32.2	39.2	66.1	85.2	150.5	137.2	117.6	89.6
Other	17.1	23.3	35.5	42.5	37.1	53.3	63.6	82.4	84.4	87.2	98.7	72.8
Metal Cutting, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	(b)	50.9	65.1	50.0	70.9	68.9	83.2
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	35.2	45.9	31.7	19.9
Parts	21.7	38.6	52.2	54.8	48.3	67.5	99.5	194.5	217.8	193.6	200.7	120.0
METAL FORMING	37.6	47.0	68.9	79.4	89.7	95.5	150.7	241.9	274.7	227.8	231.3	263.3
Complete Machines	31.4	41.1	61.6	69.4	73.0	81.7	133.1	210.7	230.6	185.9	196.0	229.5
Metal Forming, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	(b)	4.1	4.5	3.9	4.5	4.6	5.2
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	3.5	5.5	3.9	5.5
Parts	6.1	5.9	7.3	10.0	16.7	13.8	17.6	31.2	40.6	36.3	35.4	33.8

r - Revised.

(a) Included in "Other Metal Cutting Machine Tools."

(b) Included in respective machine classifications.

Note: Individual items may not add to totals due to rounding. This table is based on a set of classifications which was expanded in 1978. A separate table on the following page reports import data for 1982 and 1983 using the more detailed machine tool categories.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.

It should be noted that machine tool imports, as reflected in government statistics, are actually undervalued. They reflect values in the country of origin and do not include ocean freight, insurance, dealer commissions or import duties. The purchaser in this country is paying significantly more for imported machine tools than is reported in the import statistics.

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1982 and 1983

(Value in Thousands of Dollars)

Machine Classification	1982		1983	
	Units	Value	Units	Value
GRAND TOTAL	1,202,511	$1,258,062(a)	1,770,995	$836,914(a)
Complete New Machines	1,190,835	$1,025,679	1,760,644	$697,015
Gear Hobbers	117	13,082	44	6,834
Gear Shapers	13	906	5	616
Gear Cutting Machines, N.E.C.	17	2,364	19	996
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	1,002	81,062	1,295	90,284
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	122	17,093	53	6,437
Horizontal Machining Centers, ATC, NC	401	51,713	303	37,050
Machining Center, NC, N.E.C.	348	38,997	285	31,163
Single Station and Multi-Station Transfer Machines	50	7,462	7	1,640
Way Type Machines (Unit Heads)	—	—	—	—
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	16	3,354	13	3,473
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	—	—	40	8,047
Vertical Boring-Drilling-Milling Machines, NC	78	12,345	24	2,707
Horiz. Boring-Drilling-Milling Machines, non-NC	115	13,184	45	4,734
Vertical Boring-Drilling-Milling Machines, non-NC	2,550	15,379	873	6,766
Drilling Machines, NC	12	1,537	57	2,257
Drilling Machines, Multi-Spindle, non-NC	56	3,050	15	301
Drilling Machines, Radial, non-NC	825	7,405	218	1,867
Drilling Machines, Upright, Single Spindle, non-NC	138	950	101	577
Drilling Machines, non-NC, N.E.C.	286	7,769	194	4,908
Milling Machines, NC	215	15,539	221	13,559
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	167	6,717	94	4,364
Milling Machines, Knee Type, non-NC	2,902	26,780	1,538	13,301
Milling Machines, Bed Type, non-NC	190	8,556	255	4,709
Milling Machines, non-NC, N.E.C.	2,511	30,091	1,552	16,539
Vertical Boring Machines, incl. VTL's NC	46	9,275	19	3,854
Vertical Boring Machines, incl. VTL's, non-NC	166	10,340	159	6,175
Boring Machines, NC, N.E.C.	10	1,849	6	1,683
Boring Machines, non-NC, N.E.C.	159	13,085	148	7,193
Horizontal Lathes, NC, Less Than 25 HP	1,538	87,974	1,245	65,377
Horizontal Lathes, NC, 25-50 HP	706	65,599	310	26,688
Horizontal Lathes, NC, Over 50 HP	246	40,480	54	6,841
Horizontal Engine & Toolroom Lathes, non-NC	5,904	60,437	3,248	24,037
Automatic Chucking Lathes, Single Spindle, non-NC	92	1,821	98	3,620
Automatic Chucking Lathes, Multi-Spindle, non-NC	106	4,868	54	1,289
Automatic Bar Machines, Single Spindle, non-NC	148	5,552	52	1,034
Automatic Bar Machines, Multi-Spindle, non-NC	51	3,112	24	2,057
Horizontal Lathes, non-NC, N.E.C.	692	16,753	415	6,506
Vertical Lathes, excl. VTL's, NC	271	24,914	213	14,572
Vertical Lathes, excl. VTL's, non-NC	1,387	27,081	949	13,656
Gear Tooth Grinding & Finishing Machines	134	9,471	85	5,401
Tool & Cutter Grinding Machines, NC	92	5,492	26	1,684
Tool & Cutter Grinding Machines, non-NC	896	17,233	686	10,833
Honing & Lapping Machines	218	5,799	132	3,039
Grinding Machines, Flat Surface, NC	35	6,367	37	5,926
Grinding Machines, Flat Surface Reciprocating Table, non-NC	605	10,512	363	5,324
Grinding Machines, Flat Surface, non-NC, N.E.C.	1,203	21,013	697	12,405
Grinding & Polishing Machines, NC, N.E.C.	49	6,233	41	6,876
External Grinding Machines, non-NC	350	12,176	265	13,585
Internal Grinding Machines, non-NC	189	5,806	146	5,027
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	169	5,692	134	4,388
Grinding Machines, non-NC, N.E.C.	744	21,231	755	20,536
Traveling Wire Electrical Discharge Machines	257	13,822	420	17,923
All Other Electrical Discharge Machines	133	7,666	351	14,098
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	58	4,484	25	3,493
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	91	3,516	78	4,165

Footnotes at end of Table.

(Continued)

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1982 and 1983

(Value in Thousands of Dollars)

(Continued)

Machine Classification	1982		1983	
	Units	Value	Units	Value
Metal Cutting Machine Tools, NC, N.E.C.	47	$ 9,784	25	1,778
Sawing & Cut-off Machines, non-NC	1,044	14,173	1,016	17,804
Broaching Machines, non-NC	72	6,360	14	755
Metal Cutting Machine Tools, non-NC, N.E.C.	633	31,394	438	10,918
Metal Cutting Machine Tools, Less Than $2,500	1,160,183	68,870	1,740,665	83,231
Metal Cutting Machine Tools, Used or Rebuilt	11,676	31,672	10,351	19,900
Parts	—	200,711	—	119,999

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

U.S. IMPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1982 and 1983

(Value in Thousands of Dollars)

Machine Classification	1982		1983	
	Units	Value	Units	Value
GRAND TOTAL	32,550	$231,340(a)	47,202	$263,303(a)
Complete New Machines	32,064	$192,039	46,844	$224,068
Die Casting Machines	128	5,105	138	10,562
Punching & Shearing Machines, incl. Combination, NC	211	25,549	200	19,046
Shearing Machines, non-NC	597	8,025	594	10,335
Punching & Combination Punching & Shearing Machines, non-NC	704	7,993	450	6,082
Bending, Folding, Straightening & Flattening Machines, NC	58	3,491	86	7,430
Press Brakes, non-NC	341	6,328	473	8,568
Bending Rolls, Ram & Press Bending Machines, non-NC	152	3,995	144	2,767
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	810	17,927	799	16,112
Metal Forming Machine Tools, NC, N.E.C.	11	13,227	19	920
Mechanical Presses, non-NC	163	19,975	152	25,246
Hydraulic Presses, Vertical, Single Action, non-NC	98	3,289	105	6,500
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	265	17,085	299	20,454
Headers & Upsetters, non-NC	130	11,589	66	5,822
Forging Machines, non-NC, N.E.C.	77	9,957	55	33,930
Metal Forming Machine Tools, non-NC, N.E.C.	889	33,875	1,305	45,024
Metal Forming Machine Tools, Less Than $2,500	27,430	4,591	41,959	5,231
Metal Forming Machine Tools, Used or Rebuilt	486	3,918	358	5,470
Parts	—	35,383	—	33,765

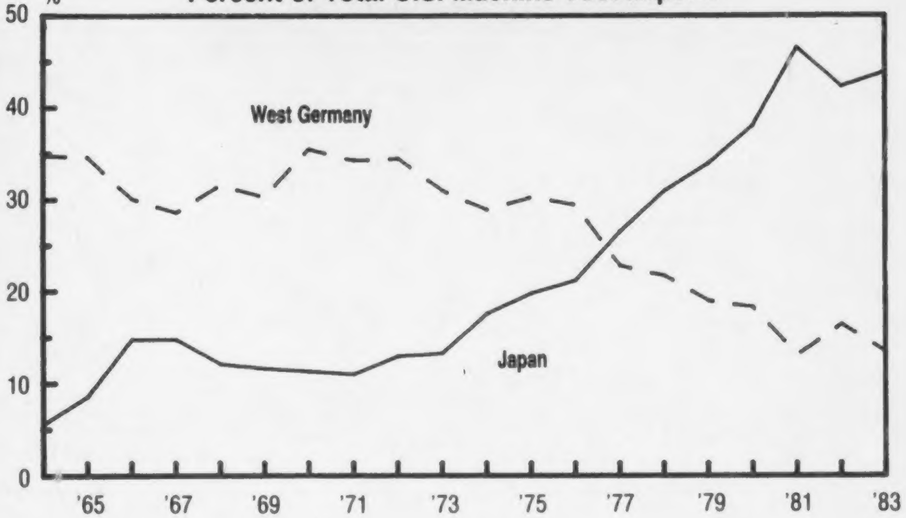
N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

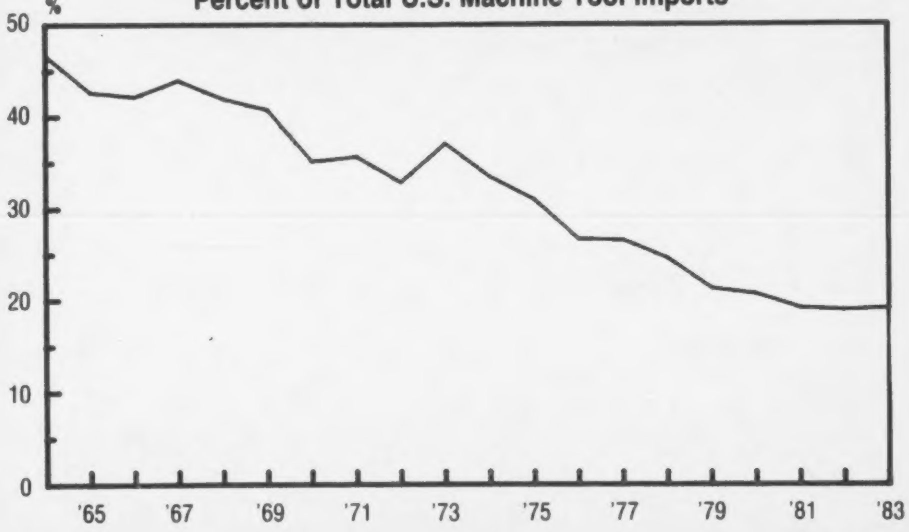
U.S. Machine Tool Imports From West Germany and Japan

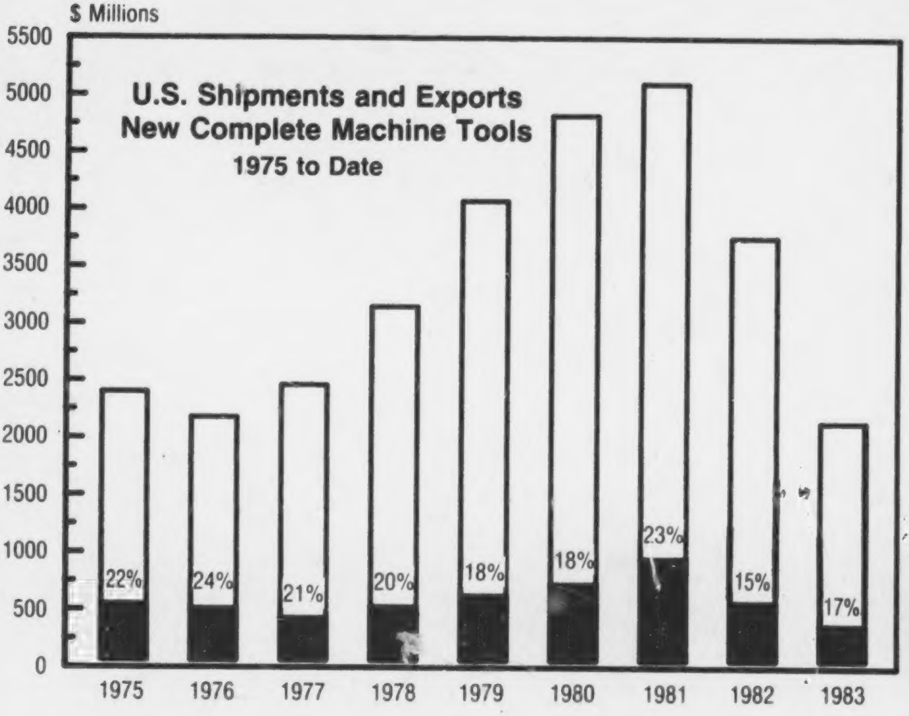
Percent of Total U.S. Machine Tool Imports



U.S. Machine Tool Imports From The United Kingdom, Italy, France, & Switzerland

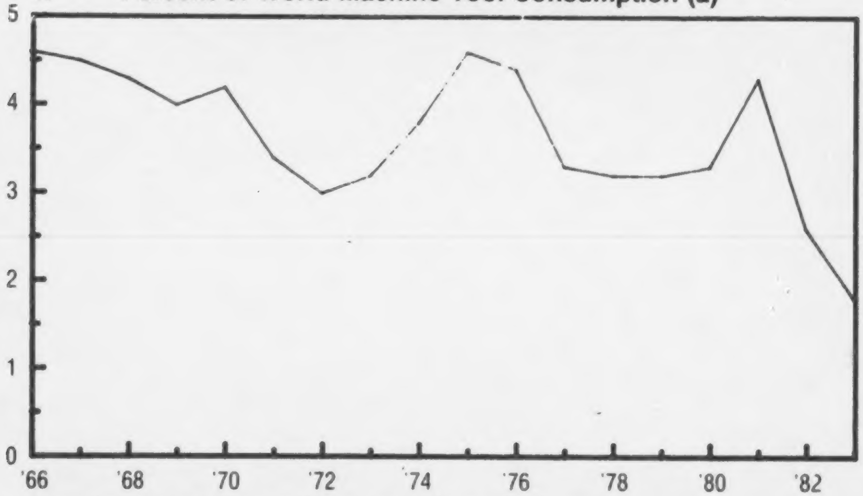
Percent of Total U.S. Machine Tool Imports





U.S. Machine Tool Exports

Percent of World Machine Tool Consumption (a)



(a) Excludes U.S. consumption domestically produced machine tools.

Source: American Machinist, U.S. Department of Commerce and NMTBA.

U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming By Destination, 1972 to Date

(Millions of Dollars)

Destination	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
GRAND TOTAL	$260.0	$350.5	$443.8	$567.6	$546.5	$452.1	$560.2	$648.8	$785.3	$1,027.6	$615.0	$406.0
EUROPE	96.2	131.0	192.2	242.2	194.1	163.8	201.3	212.3	228.0	231.8	163.6	128.6
Austria	1.0	.8	2.0	.5	1.5	1.8	.3	.9	1.8	1.3	1.2	2.3
Belgium	3.1	5.7	7.8	9.8	5.0	7.8	8.7	4.1	3.6	4.9	2.9	1.5
Denmark	.7	.9	1.1	1.2	2.1	2.5	1.7	3.1	3.1	1.3	1.4	.4
Finland	.6	.2	1.1	1.0	2.0	.9	.6	1.9	1.5	1.8	6.3	1.1
France	12.2	16.4	11.9	15.9	18.9	10.8	12.2	20.4	21.3	29.2	19.2	12.5
Germany, West	10.4	12.2	16.9	13.8	16.0	23.7	29.7	28.5	33.7	35.2	21.8	30.9
Greece	.2	.5	.9	1.7	1.1	.5	1.2	4.5	1.1	1.4	1.6	.3
Ireland	1.0	1.3	1.0	2.1	1.5	1.0	2.0	2.9	3.5	11.4	4.2	4.5
Italy	13.1	12.8	22.9	11.6	13.8	13.5	11.0	17.5	13.4	16.7	14.9	15.5
Netherlands	3.8	4.1	5.2	4.3	3.6	4.5	4.8	5.3	7.8	7.4	3.3	2.7
Norway	.3	.4	.3	2.9	1.7	4.1	1.5	2.3	1.9	1.0	.6	.3
Poland	1.2	2.7	3.2	7.9	13.5	8.2	24.2	3.1	2.1	(a)	.3	2.0
Portugal	.5	.9	.6	.3	.7	.2	.3	.4	.4	2.1	.1	(a)
Romania	.6	.5	.4	1.9	1.6	4.8	21.0	6.6	3.3	1.5	3.3	(a)
Spain	4.9	10.9	6.1	28.2	5.8	4.3	3.7	4.6	13.5	14.2	6.3	2.1
Sweden	3.6	4.7	9.9	9.1	13.2	10.2	6.7	4.0	11.0	5.5	5.0	2.7
Switzerland	1.8	2.3	4.1	4.1	2.8	3.2	4.2	6.2	12.5	9.2	7.1	5.3
United Kingdom	16.6	19.7	27.7	34.8	38.3	26.6	46.4	64.7	62.9	64.1	59.8	35.0
U.S.S.R.	19.9	30.5	68.1	89.1	48.1	31.4	16.7	27.3	25.8	16.5	1.3	7.5
Yugoslavia	.5	3.2	.9	1.5	2.2	1.6	3.6	3.6	2.1	4.8	1.1	.7
All Other	.1	.3	.2	.5	.2	1.7	.4	.4	1.7	2.3	1.8	1.4
NORTH AND CENTRAL AMERICA	63.8	82.5	103.9	123.7	136.7	109.4	119.8	167.9	304.4	520.5	221.6	108.1
Canada	43.2	57.3	65.0	76.7	78.9	61.1	76.5	95.4	162.4	256.1	82.3	61.7
Mexico	17.8	22.5	34.9	40.3	52.9	42.0	36.9	67.7	135.7	258.9	135.9	42.5
All Other	2.0	2.3	3.0	5.1	4.1	5.1	5.4	4.8	6.3	5.5	3.3	3.8
SOUTH AMERICA	38.1	58.4	50.5	77.9	116.6	73.8	75.3	89.5	64.5	62.1	51.5	18.4
Argentina	4.1	4.2	3.2	4.0	4.3	3.2	10.8	8.0	13.8	7.7	8.2	1.9
Brazil	25.8	43.6	38.2	55.4	86.5	40.5	31.2	23.8	19.2	24.2	21.0	10.9
Chile	.2	.1	.6	.6	1.3	1.1	1.2	2.3	2.3	2.2	2.0	.3
Colombia	1.4	1.4	.8	2.2	1.3	4.8	3.1	4.1	5.6	4.6	3.4	1.7
Ecuador	.1	.3	.6	.9	1.5	2.4	2.5	4.0	1.6	3.9	1.3	.4
Peru	.6	1.4	.7	2.0	2.1	1.0	.3	1.7	2.2	3.5	.9	.1
Venezuela	5.8	7.0	5.9	12.4	19.2	20.2	25.5	45.2	18.9	15.1	14.3	2.9
All Other	.2	.4	.5	.4	.4	.6	.7	.4	.9	.9	.3	.1

(Continued)

U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming By Destination, 1972 to Date

(Millions of Dollars)

(Continued)

Destination	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ASIA	$51.8	$67.0	$74.7	$89.8	$79.2	$87.5	$139.3	$151.9	$158.8	$163.6	$141.5	$131.6
China	(a)	(a)	(a)	(a)	(a)	(a)	6.0	9.3	6.7	1.5	2.4	16.6
Hong Kong	.5	.6	.4	.6	.7	1.2	2.3	1.6	4.0	10.2	2.5	2.2
India	2.4	2.3	1.9	3.0	2.5	4.2	6.9	4.4	9.7	15.2	15.4	5.4
Iran	.8	1.1	1.2	6.3	12.1	9.7	21.0	1.9	0	(a)	1.0	(a)
Israel	1.9	2.7	3.6	5.8	3.9	3.9	4.1	10.9	12.4	7.7	6.8	7.0
Japan	31.3	40.2	49.1	38.5	27.0	22.1	39.0	48.3	59.1	54.2	51.0	35.7
Korea, Republic of	5.0	8.8	3.6	5.0	5.1	6.8	24.0	34.1	24.3	15.0	11.2	8.8
Philippines	.7	.6	3.9	6.4	1.8	1.5	1.4	2.6	3.3	3.2	5.2	2.0
Saudi Arabia	(a)	(a)	(a)	(a)	(a)	(a)	9.1	15.2	10.9	14.9	17.3	21.8
Singapore	2.1	2.0	1.9	2.9	3.1	3.9	5.5	6.3	5.5	13.7	14.7	9.3
Taiwan	1.9	4.3	3.7	7.6	9.1	17.1	9.6	10.1	15.3	16.2	8.1	9.2
Turkey	1.5	.7	1.0	2.7	1.0	.6	4.8	1.5	.4	1.4	1.2	3.4
All Other	3.7	3.8	4.4	11.0	12.9	16.5	5.6	5.6	7.2	10.3	4.8	10.2
OCEANIA	5.2	8.1	12.9	21.5	8.3	7.8	13.7	17.0	12.2	22.7	12.7	9.1
Australia	4.8	7.7	12.1	21.0	7.4	6.6	12.8	15.4	10.7	21.6	11.1	8.0
New Zealand	.4	.5	.9	.5	.8	1.1	.8	1.6	1.4	.7	1.4	1.0
All Other	(a)	(a)	(a)	(a)	.1	.1	.1	(a)	.1	.4	.1	.1
AFRICA	4.9	3.6	9.5	12.4	11.6	9.8	10.6	10.2	17.3	26.9	24.0	10.1
Egypt	(a)	(a)	(a)	.1	.4	1.2	1.1	.9	2.5	6.3	3.9	2.2
South Africa	3.1	2.7	7.5	9.1	7.7	4.9	6.4	5.6	11.8	16.9	10.5	5.4
All Other	1.8	.9	2.0	3.2	3.5	3.7	3.2	3.7	3.0	3.7	9.6	2.4

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. These figures represent exports of domestic merchandise; value at U.S. port. The figures are lower than those for total exports because they include used machines but exclude parts. They are higher than manufacturers' export shipments because the latter are priced f.o.b. factory and exclude export shipments made by other than manufacturers.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS

By Country of Destination, 1972 to Date

(Millions of Dollars)

Destination	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
GRAND TOTAL	$148.3	$205.5	$264.3	$343.1	$289.8	$257.7	$366.5	$408.0	$495.4	$724.0	$403.5	$258.3
EUROPE	63.3	80.6	121.7	161.6	115.4	103.7	143.7	144.7	150.0	153.6	112.1	84.4
Austria	.5	.6	1.3	.2	1.2	1.3	.2	.8	1.4	1.2	1.0	1.9
Belgium	1.4	4.1	5.1	5.3	2.8	5.5	5.5	2.2	.8	1.6	2.1	.8
Denmark	.3	.5	.4	.6	1.9	1.8	.9	1.3	1.3	.5	.8	(a)
Finland	.5	.1	.8	.5	1.3	.1	.6	1.8	1.4	1.3	2.4	.3
France	7.8	10.0	5.9	8.5	11.7	5.0	7.5	11.1	10.6	19.1	13.9	5.1
Germany, West	5.3	5.9	9.9	8.3	8.8	13.2	18.1	17.3	22.8	27.3	16.5	17.0
Greece	.1	(a)	.2	.2	.6	.2	.9	1.4	.6	.3	.7	.1
Ireland	.7	.4	.3	.3	.7	.2	1.4	1.1	2.5	3.0	1.9	1.8
Italy	8.3	6.0	16.5	8.9	5.8	9.1	6.6	11.1	9.7	10.1	6.5	8.7
Netherlands	1.8	1.5	1.8	1.9	1.0	2.5	2.9	3.9	5.0	1.5	1.3	1.2
Norway	.1	.4	.2	2.2	1.5	3.9	1.0	1.8	.9	.7	.4	.1
Poland	1.2	2.3	2.9	4.4	4.5	3.9	19.4	2.7	2.1	(a)	.2	1.5
Portugal	.3	.1	.3	.1	.1	.1	.2	.2	.3	1.6	.1	(a)
Romania	.6	.1	.1	.3	1.4	4.8	20.9	1.3	2.3	1.4	1.2	(a)
Spain	2.9	6.1	2.5	19.1	3.6	2.6	2.0	3.3	3.1	8.2	4.0	1.4
Sweden	3.2	3.0	7.9	7.6	11.6	9.1	5.7	3.2	7.5	3.5	2.2	1.5
Switzerland	1.5	2.0	3.1	3.2	2.3	2.4	3.7	5.3	8.9	7.8	5.4	5.2
United Kingdom	8.7	9.4	17.0	21.0	21.6	13.3	27.2	67.4	42.8	46.7	49.3	29.5
U.S.S.R.	17.7	26.2	44.8	67.6	31.8	23.0	15.5	4.6	23.6	15.1	1.2	7.4
Yugoslavia	.3	1.7	.5	1.1	.8	.7	3.4	2.4	1.1	1.8	.5	.6
All Other	0	.2	.1	.3	(a)	.6	.3	.4	1.3	.9	.4	.1
NORTH AND CENTRAL AMERICA	32.1	45.4	57.4	69.0	74.6	60.6	71.1	108.1	205.1	401.8	137.5	60.8
Canada	22.5	31.4	35.8	45.0	39.6	34.7	44.7	60.4	116.2	208.0	57.6	33.8
Mexico	8.5	12.7	19.5	21.3	33.4	23.5	23.0	44.8	86.2	190.8	78.0	24.6
All Other	.9	1.1	1.5	2.2	1.5	2.1	2.8	2.9	2.7	3.0	1.9	2.4
SOUTH AMERICA	19.7	38.4	29.3	38.2	47.1	41.9	44.1	37.9	33.0	33.2	33.8	12.1
Argentina	1.5	1.7	2.4	2.6	2.1	2.0	6.6	3.7	6.5	4.3	6.0	1.1
Brazil	15.6	33.4	23.9	29.9	34.9	28.0	25.5	18.5	14.6	14.7	16.2	8.0
Chile	.1	.1	.2	.4	1.0	.6	.4	.6	.9	1.3	.6	.2
Colombia	.4	.4	.2	1.0	.3	1.4	1.3	1.4	3.2	2.1	2.5	.9
Ecuador	(a)	.1	.2	.4	.9	.6	1.3	1.3	.7	1.7	.5	.1
Peru	.4	.3	.3	.6	.5	.4	.2	.5	.6	.6	.8	(a)
Venezuela	1.7	2.2	2.0	3.2	7.2	8.6	8.6	11.5	5.9	7.9	7.0	1.6
All Other	.1	.2	.1	.1	.2	.3	.3	.3	.6	.6	.1	.1

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS

By Country of Destination, 1972 to Date

(Millions of Dollars)

(Continued)

Destination	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ASIA	$28.0	$35.2	$43.6	$51.5	$42.1	$43.0	$96.5	$100.6	$90.8	$105.9	$100.4	$92.7
China	(a)	(a)	(a)	(a)	(a)	(a)	4.6	8.8	3.9	1.3	2.0	13.1
Hong Kong	.2	.5	.3	.3	.5	.5	1.8	1.3	.9	1.8	1.5	1.6
India	2.1	1.8	1.2	2.0	1.9	2.3	4.1	3.4	7.0	10.4	11.7	4.2
Iran	.4	.7	.5	1.8	1.8	3.3	7.2	.3	0	(a)	.6	(a)
Israel	1.2	1.1	2.1	3.7	2.5	3.1	3.0	6.3	4.3	5.3	4.0	3.0
Japan	17.2	24.4	29.6	23.6	15.6	12.1	30.9	31.1	38.6	40.8	36.6	30.1
Korea, Rep. of	1.3	1.2	1.7	1.8	4.3	5.6	22.1	24.2	16.4	12.7	9.0	6.0
Philippines	.4	.2	3.2	5.0	1.1	.5	1.0	1.6	1.6	1.9	4.0	1.5
Saudi Arabia	(a)	(a)	(a)	(a)	(a)	(a)	3.9	7.4	4.7	8.0	8.3	9.0
Singapore	1.1	1.3	.8	2.0	1.5	2.2	4.6	5.2	3.8	10.4	11.6	6.3
Taiwan	1.2	1.7	2.2	4.2	4.9	5.0	6.1	6.9	6.5	6.5	7.3	7.8
Turkey	.5	.4	.3	1.4	.5	.5	4.5	1.5	.3	.9	.7	2.6
All Other	1.8	1.9	1.6	5.6	7.5	7.9	2.7	2.5	2.8	5.8	3.2	7.5
OCEANIA	2.5	4.5	7.0	15.4	4.8	3.7	6.3	9.8	5.5	15.9	6.7	4.0
Australia	2.3	4.3	6.7	15.2	4.2	3.2	5.8	8.6	4.9	15.3	6.1	3.2
New Zealand	.2	.1	.3	.2	.6	.5	.4	1.2	.5	.3	.6	.6
All Other	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	.3	.1	.1
AFRICA	2.7	1.5	5.4	7.4	5.8	4.8	4.8	6.9	10.8	13.5	12.8	4.2
Egypt	(a)	(a)	(a)	.1	.2	.6	.4	.7	1.8	3.2	2.4	.7
Rep. of South Africa	1.2	1.0	4.5	5.6	3.8	3.1	3.4	4.7	7.8	8.5	7.8	2.8
All Other	1.5	.5	.2	1.8	1.8	1.1	.9	1.5	1.2	1.8	2.8	.8

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. Figures include used machine tools but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1972 to Date

(Millions of Dollars)

Destination	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
GRAND TOTAL	$111.7	$145.1	$179.5	$224.5	$256.7	$194.4	$193.7	$240.8	$290.0	$303.6	$211.5	$147.7
EUROPE	32.9	50.3	70.6	80.7	78.7	60.1	57.7	67.6	78.1	78.2	51.4	44.3
Austria	.4	.2	.6	.4	.3	.5	.1	.1	.4	.1	.2	.4
Belgium	1.7	1.6	2.7	4.5	2.2	2.3	3.2	1.8	2.9	3.2	.8	.7
Denmark	.4	.5	.7	.6	.2	.7	.8	1.8	1.7	.8	.6	.3
Finland	.1	.1	.3	.5	.8	.7	(a)	.1	.1	.5	3.9	.8
France	4.5	6.4	6.0	7.4	7.2	5.8	4.7	9.3	10.6	10.0	5.3	7.4
Germany, West	5.1	6.3	7.0	5.5	7.2	10.5	11.6	11.1	10.9	7.9	5.3	13.9
Greece	.1	.4	.7	1.5	.5	.4	.3	3.1	.6	1.1	.9	.3
Ireland	.3	.9	.7	1.8	.7	.8	.6	1.8	1.1	8.5	2.3	2.7
Italy	4.8	6.8	6.4	2.7	8.0	4.4	4.4	6.4	3.7	6.7	8.5	6.8
Netherlands	2.0	2.6	3.4	2.5	2.6	1.9	1.9	1.5	2.8	5.9	2.0	1.5
Norway	.2	(a)	.1	.6	.2	.3	.5	.5	1.0	.3	.2	.2
Poland	(a)	.3	.3	3.5	9.0	4.3	4.8	.4	(a)	0	(a)	.5
Portugal	.2	.8	.3	.2	.6	(a)	.2	.2	.2	.5	(a)	(a)
Romania	0	.4	.3	1.6	.2	(a)	.1	5.3	1.0	.1	2.1	0
Spain	1.9	4.9	3.6	9.0	2.2	1.7	1.8	1.3	10.4	6.0	2.3	.6
Sweden	.4	1.6	2.0	1.5	1.5	1.1	1.1	.8	3.4	2.0	2.9	1.1
Switzerland	.4	.3	1.0	.9	.5	.8	.6	.9	3.6	1.4	1.7	.2
United Kingdom	7.9	10.2	10.7	13.8	16.7	13.4	19.2	16.3	20.2	17.3	10.5	5.6
U.S.S.R.	2.2	4.4	23.3	21.4	16.3	8.4	1.2	2.7	2.2	1.4	.1	(a)
Yugoslavia	.2	1.5	.4	.4	1.5	.9	.1	1.3	1.0	3.1	.6	(a)
All Other	.2	.1	0	.2	.2	1.1	.3	1.0	.1	1.4	1.5	1.3
NORTH AND CENTRAL AMERICA	31.7	37.1	46.6	54.7	62.1	48.8	48.7	59.8	99.4	118.8	84.1	47.3
Canada	20.7	26.0	29.2	31.6	39.3	26.4	31.8	34.9	46.2	48.2	24.7	28.0
Mexico	9.3	9.8	15.4	19.1	19.5	18.5	13.9	22.9	49.5	68.1	57.9	17.9
All Other	1.1	1.2	1.5	2.9	2.6	3.0	2.6	2.0	3.7	2.5	1.5	1.4
SOUTH AMERICA	18.3	20.0	21.1	39.7	69.5	31.9	31.2	51.7	31.6	28.8	17.7	6.3
Argentina	2.5	2.5	.8	1.4	2.2	1.2	4.3	4.3	7.3	3.4	2.2	.8
Brazil	10.2	10.2	14.3	25.4	51.6	12.5	5.7	5.3	4.7	9.5	4.8	3.0
Chile	.2	(a)	.4	.2	.3	.5	.8	1.7	1.4	.9	1.4	(a)
Colombia	.9	1.0	.6	1.2	1.0	3.4	1.8	2.6	2.4	2.5	.9	.8
Ecuador	(a)	.2	.4	.5	.6	1.9	1.2	2.6	.9	2.2	.8	.3
Peru	.2	1.0	.4	1.5	1.6	.6	.1	1.2	1.6	2.9	.1	.1
Venezuela	4.1	4.8	3.9	9.2	12.0	11.6	16.9	33.7	13.0	7.2	7.3	1.3
All Other	.1	.2	.3	.3	.2	.2	.4	.3	.3	.2	.2	(a)

(Continued)

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1972 to Date

(Millions of Dollars)

(Continued)

Destination	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ASIA	$23.7	$31.9	$3.1	$38.3	$37.0	$44.5	$42.8	$51.2	$67.9	$57.7	$41.1	$38.9
China	(a)	(a)	(a)	(a)	(a)	(a)	1.4	.5	2.8	.2	.4	3.6
Hong Kong	.3	.1	.2	.2	.2	.7	.5	.3	3.0	8.4	1.0	.6
India	.3	.5	.7	.9	.5	1.9	2.8	1.0	2.7	4.8	3.7	1.1
Iran	.4	.4	.7	4.5	10.3	6.4	13.7	1.6	0	(a)	.4	0
Israel	.7	1.5	1.5	2.0	1.4	.7	1.1	4.6	8.1	2.4	2.8	4.0
Japan	13.6	15.8	19.5	15.0	11.4	9.9	8.1	17.1	20.5	13.4	14.4	5.6
Korea, Rep. of	3.7	7.6	1.9	3.2	.8	1.3	2.0	9.9	7.9	2.3	2.3	2.8
Philippines	.3	.5	.7	1.4	.7	1.0	.4	1.0	1.7	1.3	1.2	.6
Saudi Arabia	(a)	(a)	(a)	(a)	(a)	(a)	5.2	7.8	6.3	6.9	9.0	12.8
Singapore	1.0	.7	1.1	.9	1.6	1.7	.8	1.1	1.6	3.3	3.1	2.9
Taiwan	.7	2.6	1.4	3.4	4.2	12.1	3.5	3.2	8.8	9.7	.8	1.4
Turkey	.9	.2	.7	1.3	.5	.1	.4	(a)	.1	.5	.5	.8
All Other	1.8	2.0	2.6	13.2	5.4	8.7	2.9	3.1	4.4	4.4	1.6	2.8
OCEANIA	2.7	3.6	5.9	6.1	3.6	4.1	7.5	7.2	6.7	6.7	5.9	5.1
Australia	2.6	3.3	5.4	5.7	3.3	3.4	7.1	6.8	5.8	6.2	5.0	4.7
New Zealand	.2	.3	.5	.4	.2	.5	.3	.4	.8	.4	.9	.4
All Other	(a)	(a)	(a)	(a)	.1	.1	.1	(a)	(a)	.1	.1	0
AFRICA	2.3	2.1	4.2	5.0	5.8	5.0	5.8	3.3	6.3	13.4	11.2	5.8
Egypt	(a)	(a)	(a)	.1	.2	.6	.6	.2	.8	3.1	1.5	1.5
Rep.of South Africa	1.9	1.7	3.0	3.5	3.9	1.8	2.9	.9	4.0	8.3	2.7	2.7
All Other	.3	.4	1.2	1.4	1.7	2.6	2.3	2.2	1.6	2.0	7.0	1.7

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. Figures include used machine tools for all years but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1972 to 1981
(Millions of Dollars)

Machine Classification	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
GRAND TOTAL	$186.7	$248.8	$320.7	$417.2	$362.7	$321.4	$453.7	$544.9	$674.6	$974.2
Complete New Machines	137.4	194.6	245.5	327.9	273.8	247.2	353.0	392.5	462.8	668.6
Machining Centers, N.C.										
Vertical, A.T.C.	(b)	(b)	18.4	27.4	35.5	35.9	13.1	14.1	9.3	11.4
Horizontal, A.T.C.							18.2	28.5	24.3	27.0
Manual Tool Change							2.2	2.8	23.2	15.0
Vertical Boring-Drilling-Milling	(b)	(b)	(b)	(b)	(b)	(b)	.9	.9	8.2	42.1
Horizontal Boring-Drilling-Milling	5.1	5.8	8.5	8.4	5.8	11.4	9.1	14.4	5.8	12.9
Vertical Boring and Turning Mills (incl. Vertical Turret Lathes)	2.7	2.5	3.3	7.7	8.1	6.6	6.6	10.6	13.6	18.7
Boring-Drilling-Milling, N.E.C.	3.5	1.9	2.4	3.7	2.4	2.2	5.0	6.5	5.5	5.7
Drilling, Vertical (Upright)	2.4	2.4	2.8	6.4	4.9	4.6	2.5	2.0	1.4	2.9.
Multiple Spindle	2.7	2.4	1.7	1.8	1.3	1.6	3.3	3.6	11.5	7.8
Radial	.3	.5	.9	.9	1.6	1.1	1.6	1.3	1.9	2.0
Other	4.1	7.3	7.5	4.7	5.8	7.4	6.4	9.9	7.5	11.7
Gear Hobbers and Shapers (c)	1.3	.7	.8	1.8	1.6	.4	1.3	2.1	8.8	22.7
Gear Tooth Grinding & Finishing	4.7	8.0	6.5	5.9	7.9	3.8	12.8	4.4	14.0	18.1
Other Gear Cutting (h)	24.0	18.9	21.9	23.7	16.2	23.9	32.9	37.3	38.4	39.3
External Cylindrical Grinding	4.9	8.4	10.8	9.6	11.1	3.7	34.0	13.2	9.3	15.9
Surface Grinding	4.4	7.0	6.8	8.6	10.8	8.3	8.8	11.4	16.8	26.2
Tool and Cutter Grinding	6.9	7.4	7.5	7.9	7.1	7.3	6.8	5.7	9.2	9.5
Polishing and Buffing	1.0	2.6	1.7	1.3	1.0	.9	2.7	2.9	5.2	11.2
Honing and Lapping	2.6	5.1	3.4	4.1	7.0	3.3	4.3	3.8	3.9	9.5
Internal Cylindrical Grinding	3.0	6.5	9.6	6.3	6.9	3.7	4.9	5.9	7.8	5.1
Other Grinding and Polishing (d)	7.4	13.5	13.3	15.2	13.4	12.9	19.3	23.1	32.7	49.0
Engine Lathes	3.1	5.2	3.8	6.8	6.1	4.3	8.3	6.1	3.0	5.6
Turret Lathes (Excl. Vertical)	2.0	2.3	4.5	4.6	9.4	6.7	7.1	7.0	(g)	(g)
Automatic Chucking Lathes										
Single Spindle	2.2	3.8	2.8	9.9	7.6	4.2	7.7	12.4	5.6	7.5
Multiple Spindle	1.7	1.8	5.3	2.8	2.8	4.6	3.4	4.9	3.6	4.3
Automatic Screw Machines	5.1	3.9	6.0	7.4	6.2	5.7	5.2	6.3	9.8	10.9
Other Lathes	7.0	7.3	8.6	12.1	15.3	16.8	11.9	16.3	45.1	61.8
Milling Machines										
Knee Type	3.0	3.1	4.6	4.7	3.2	4.5	4.0	3.4	1.1	.5
Bed Type	1.7	.5	1.6	1.8	1.7	2.9	11.9	2.8	2.8	2.0
Profile, Dup. & Die Sinking	3.8	2.3	2.9	2.9	3.4	1.0	5.5	4.9	2.9	5.5
Other	5.1	8.1	5.7	11.2	6.0	12.9	9.1	12.3	12.4	29.8
Broaching	1.3	2.5	3.2	5.5	1.8	3.4	11.6	2.4	6.9	15.5
Planers, Other than Gear	.3	.4	.3	.5	.6	.7	1.5	1.6	(b)	(b)
Shapers and Slotters	.6	.3	.3	.5	1.0	.6				
Sawing and Cutoff	3.9	5.1	6.1	9.0	8.5	7.0	13.5	12.5	12.2	12.6
Tapping	1.0	1.3	1.0	1.4	3.4	1.6	1.9	1.9	(b)	(b)
Threading	2.7	4.0	4.9	3.0	2.5	4.5	4.2	9.9	(b)	(b)
Electrical Discharge	(b)	(b)	(b)	(b)	(b)	(b)	3.4	5.2	10.2	5.2
Single Station (Way Type)							.3	.4	51.7	97.2
Multi-Station	6.4	30.9	39.2	72.0	25.1	7.7	16.0	42.9		
Metal Cutting Machine Tools, N.E.C.										
$2,500 and Over, New (e)	5.6	11.2	9.8	17.3	11.9	10.8	11.7	14.5	21.1	27.1
Less than $2,500, New (f)			6.5	9.0	8.9	17.9	20.5	20.5	15.9	19.0
Used and Rebuilt Machines	10.9	10.9	18.8	15.2	16.0	10.5	13.5	15.5	32.6	55.4
Parts (a)	38.4	43.3	56.4	74.1	72.9	63.7	87.3	136.9	179.2	250.2

N.E.C. - Not Elsewhere Classified.

(a) Attachments and accessories are not included after 1971.
(b) Included in "Metal Cutting Machine Tools, N.E.C."
(c) "Gear Hobbers" for years prior to 1978.
(d) "Other Grinding" for years prior to 1978 & 1979.
(e) "$1,000 and Over" for years prior to 1978.
(f) "Less than $1,000" for years prior to 1978.
(g) Included in "Other Lathes."
(h) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1972 tc 1981

(Millions of Dollars)

Machine Classification	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
GRAND TOTAL	$145.4	$194.3	$245.7	$288.6	$320.0	$258.1	$284.9	$333.7	$424.6	$471.4
Complete New Machines	100.6	130.9	165.1	208.7	241.1	179.5	180.1	226.6	271.4	281.0
Punching and Shearing Machines	5.9	5.0	9.4	13.8	20.2	15.4	13.7	22.3	44.8	44.9
Bending and Forming Machines	11.9	16.3	21.3	22.9	26.0	25.5	39.2	45.7	41.0	46.0
Hydraulic and Pneumatic Presses	18.1	26.1	27.5	37.5	46.8	29.1	21.5	32.6	42.0	56.4
Mechanical Presses, O.B.I.	15.9(a)	15.6(a)	31.1(a)	28.5(a)	33.2(a)	17.5(a)	2.2	1.1	27.7	22.9
Other Mechanical Presses							8.6	18.1		
Headers and Upsetters	11.2	9.2	8.2	8.7	10.6	9.2	14.8	13.2	4.4	7.7
Forging Machines (except Presses)		4.5	2.7	3.8	3.0	4.2	6.2	7.0	12.0	13.6
Metal Container-making Machines	6.9	11.5	16.7	17.0	23.6	12.0	22.8	32.9	(d)	(d)
Metal Forming Machines, N.E.C.	3.8	5.6	6.1	9.3	6.5	8.1	44.7	46.5	92.4(e)	83.1(e)
Metalworking Machines, N.E.C.	26.9	37.1	39.2	63.6	67.0	54.2				
Metal Forming Mach. Tools under $2,500 (b)	(a)	(a)	2.9	3.6	4.2	4.3	6.4	7.2	7.1	6.1
Used and Rebuilt Machines	11.0	14.1	14.5	15.8	15.6	14.9	13.6	14.2	18.6	22.6
Parts (c)	33.7	49.2	66.3	64.1	63.3	63.7	91.2	92.9	134.7	167.8

N.E.C. - Not Elsewhere Classified.

(a) Included in the respective metalforming and metalworking classifications for years prior to 1974.

(b) Under $1,000 for years prior to 1978.

(c) Chucks, chuckholders, tool holders and their parts and work holding, positioning equipment and other attachments and accessories are not included after 1971.

(d) Included in "Metal Forming Machines, N.E.C."

(e) From 1980 forward "Die Casting Machines & Parts" are included.

Sources: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1982 and 1983

(Values in Thousands of Dollars)

Machine Classification	1982		1983	
	Units	Value	Units	Value
GRAND TOTAL	52,906	$630,465(a)	41,292	$430,774(a)
Complete New Machines	49,589	375,645	38,219	230,624
Gear Hobbers and Shapers	37	5,323	25	1,585
Gear Cutting Machines, N.E.C. (b)	234(b)	22,868(b)	15	6,954
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	33	2,931	22	2,544
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	5	3,187	3	728
Horizontal Machining Centers, ATC, NC	74	19,051	15	4,233
Machining Centers, NC, N.E.C.	83	8,841	62	5,844
Single Station and Multi-Station Transfer Machines	42	33,317	19	20,531
Way Type Machines (Unit Heads)	20	3,070	8	597
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	10	3,246	7	2,727
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	3	1,702	1	116
Vertical Boring-Drilling-Milling Machines, NC	11	2,865	8	1,424
Horiz. Boring-Drilling-Milling Machines, non-NC	18	3,977	1	28
Vertical Boring-Drilling-Milling Machines, non-NC	33	1,700	91	4,662
Drilling Machines, NC	12	790	6	1,227
Drilling Machines, Multi-Spindle, non-NC	49	3,620	12	701
Drilling Machines, Radial, non-NC	23	1,257	56	1,202
Drilling Machines, Upright, Single Spindle, non-NC	50	820	25	2,472
Drilling Machines, non-NC, N.E.C.	215	5,886	134	2,723
Milling Machines, NC	58	11,725	15	5,036
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	43	1,615	30	1,466
Milling Machines, Knee Type, non-NC	26	822	19	1,473
Milling Machines, Bed Type, non-NC	3	276	5	145
Milling Machines, non-NC, N.E.C.	201	7,912	118	5,773
Vertical Boring Machines, incl. VTL's, NC	12	2,289	12	2,337
Vertical Boring Machines, incl. VTL's, non-NC	104	12,252	23	3322
Boring Machines, NC, N.E.C.	12	952	3	784
Boring Machines, non-NC, N.E.C.	100	3,401	47	3,123
Horizontal Lathes, NC, Less Than 25 HP	142	12,030	101	8,456
Horizontal Lathes, NC, 25-50 HP	54	11,068	24	3,870
Horizontal Lathes, NC, Over 50 HP	19	7,328	7	1.366
Horizontal Engine & Toolroom Lathes, non-NC	117	2,351	131	3,514
Automatic Chucking Lathes, Single Spindle, non-NC	8	2,329	24	2,722
Automatic Chucking Lathes, Multi-Spindle, non-NC	16	2,320	4	973
Automatic Bar Machines, Single Spindle, non-NC	28	1,058	30	1,659
Automatic Bar Machines, Multi-Spindle, non-NC	27	3,492	30	1,585
Horizontal Lathes, non-NC, N.E.C.	369	13,624	206	4,168
Vertical Lathes, excl. VTL's, NC	16	3,107	6	1,295
Vertical Lathes, excl. VTL's, non-NC	161	11,683	124	5,323
Grinding, Polishing, Honing & Lapping Machines, NC	62	11,580	53	12,316
Gear Tooth Grinding & Finishing Machines, non-NC	98	9,193	25	3,303
Tool & Cutter Grinding Machines, non-NC	215	6,484	112	5,086
Honing & Lapping Machines, non-NC	208	3,341	144	2,903
Grinding Machines, Flat Surface Reciprocating Table, non-NC	187	3,362	59	1,397
Grinding Machines, Flat Surface, non-NC, N.E.C.	202	14,045	169	11,180
External Grinding Machines, non-NC	51	7,194	33	3,869
Internal Grinding Machines, non-NC	25	4,336	8	1,422
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	170	8,099	101	3,554
Grinding Machines, non-NC, N.E.C.	757	12,704	251	7,274

Footnotes are at the end of the Table.

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1982 and 1983

(Values in Thousands of Dollars)

(Continued)

Machine Classification	1982		1983	
	Units	Value	Units	Value
Traveling Wire Electrical Discharge Machines	22	$ 292	69	$4,643
All Other Electrical Discharge Machines	177	2,868	60	1,171
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	5	369	7	288
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	61	1,389	55	1,035
Metal Cutting Machine Tools, NC, N.E.C.	26	2,234	12	805
Sawing & Cut-off Machines, non-NC	481	8,750	402	9,073
Broaching Machines, non-NC	48	13,363	10	1,442
Metal Cutting Machine Tools, non-NC, N.E.C.	486	16,123	242	11,087
Metal Cutting Machine Tools, Less Than $2,500	43,858	13,718	34,777	10,270
Metal Cutting Machine Tools, Used or Rebuilt	3,317	27,899	3,073	27,679
Parts	—	226,921	—	172,471

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

(b) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Source: U.S. Bureau of the Census "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS
By Machine Classification, 1982 and 1983

(Values in Thousands of Dollars)

Machine Classification	1982		1983	
	Units	Value	Units	Value
GRAND TOTAL	11,343	$371,922(a)	9,750	$261,090(a)
Complete New Machines	10,622	198,922	8,705	128,413
Die Casting Machines & Parts	—	10,521	—	10,314
Metal Forming Machine Tools, Less Than $2,500	7,336	4,168	6,493	3,695
Punching & Shearing Machines, incl. Combination, NC	68	8,301	23	2,615
Shearing Machines, non-NC	97	3,733	79	2,264
Punching & Combination Punching & Shearing Mach., non-NC	615	20,889	473	13,176
Bending, Folding, Straightening & Flattening Machines, NC	150	12,677	105	7,135
Press Brakes, non-NC	163	2,824	25	1,293
Bending Rolls, Ram & Press Bending Machines, non-NC	56	2,952	18	784
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	438	16,651	309	10,438
Mechanical Presses, non-NC	251	23,913	113	10,355
Hydraulic Presses, Vertical, Single Action, non-NC	80	7,657	50	3,764
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	355	22,263	270	15,843
Headers & Upsetters, non-NC	50	7,226	25	3,732
Forging Machines, non-NC, N.E.C.	140	8,072	107	4,199
Metal Forming Machine Tools, non-NC, N.E.C.	823	47,031	615	36,770
Metal Forming Machine Tools, Used or Rebuilt	721	12,547	1,045	19,247
Parts	—	160,453	—	113,430

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. FOREIGN TRADE IN MACHINE TOOLS AND PARTS

1958 to Date

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)			Imports for Consumption (Value in Foreign Country)		
Year	TOTAL	Metal Cutting	Metal Forming	TOTAL	Metal Cutting	Metal Forming
1958	$ 148.8	$100.5	$ 48.3	$ 28.1	$ 17.6	$ 10.5
1959	135.0	82.2	52.8	32.5	23.8	8.7
1960	192.5	127.8	64.7	35.7	26.3	9.4
1961	270.2	191.6	78.6	32.4	22.6	9.8
1962	303.9	205.3	98.6	37.5	28.4	9.1
1963	~~220.6~~	144.9	75.7	45.1	33.4	11.7
1964	300.8	204.8	96.0	45.6	38.1	7.5
1965	287.2	191.6	95.6	68.9	58.9	10.0
1966	273.6	176.3	97.3	137.4	121.2	16.2
1967	294.5	199.6	94.9	203.7	174.8	28.9
1968	286.0	178.2	107.8	191.3	166.1	25.2
1969	323.5	201.1	122.4	182.6	153.4	29.2
1970	403.9	268.8	135.1	158.5	126.1	32.4
1971	351.0	210.3	140.7	109.6	87.4	22.2
1972	332.1	186.7	145.4	141.8	104.2	37.6
1973	443.0	248.7	194.3	211.6	164.6	47.0
1974	566.5	320.8	245.7	330.3	261.3	69.0
1975	705.9	417.3	288.6	382.4	303.0	79.4
1976	682.7	362.7	320.0	383.3	293.6	89.7
1977	579.5	321.4	258.1	482.2	386.7	95.5
1978	738.6	453.7	284.9	832.4	681.6	150.7
1979	878.6	544.9	333.7	1,269.5	1,027.6	241.9
1980	1,099.2	674.6	424.6	1,556.9	1,282.2	274.7
1981	1,445.6	974.2	471.4	1,712.9	1,485.1	227.8
1982	1,002.4	630.5	371.9	1,489.4	1,258.1	231.3
1983	691.9	430.8	261.1	1,100.2	836.9	263.3

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metalworking machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Sources: U.S. Bureau of the Census, "EM 522" and "IM 146."

The coverage of exports reported by the Bureau of the Census in its report "EM 522" is more inclusive than that reported as "manufacturers' export shipments." The data include exports by distributors and brokers, rebuilt tools, machine tools designed for workshops, garages, etc. Values include freight, insurance, and other charges from the manufacturers' plants to the point of departure in the United States. Import values exclude import duties, insurance, ocean freight and other charges incidental to the arrival of goods in the United States.

U.S. FOREIGN TRADE IN BORING MACHINES INCLUDING VERTICAL TURRET LATHES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1965	776	$ 11.9	174	$ 4.8	394	$ 6.1
1966	484	12.1	183	5.3	692	12.8
1967	435	13.0	177	4.8	937	21.0
1968	383	14.4	147	4.4	1,057	19.4
1969	363	11.7	121	6.2	797	21.0
1970	503	18.6	158	8.1	2,223	22.8
1971	419	11.5	139	3.8	808	11.6
1972	392	11.2	71	3.0	1,083	13.6
1973	427	10.2	NA	3.7	825	14.4
1974	328	14.1	NA	12.0	1,726	28.8
1975	566	19.7	NA	8.1	2,521	41.1
1976	393	16.3	NA	9.8E	3,219	41.0
1977	382	20.3	NA	6.5	4,824	51.7
1978	577	21.7	NA	10.2	1,347	65.9
1979	724	32.4	NA	9.5	1,901	70.7
1980	626	33.2	NA	17.7	2,289	76.9
1981	797	79.4	NA	41.5E	3,158	86.7
1982(r)	303	32.4	NA	14.9	3,140	78.8
1983(p)	193	18.5	NA	D	1,327	44.6

NA - Not Available. E - Estimate by NMTBA. p - Preliminary. r - Revised. D - Withheld to avoid disclosure.

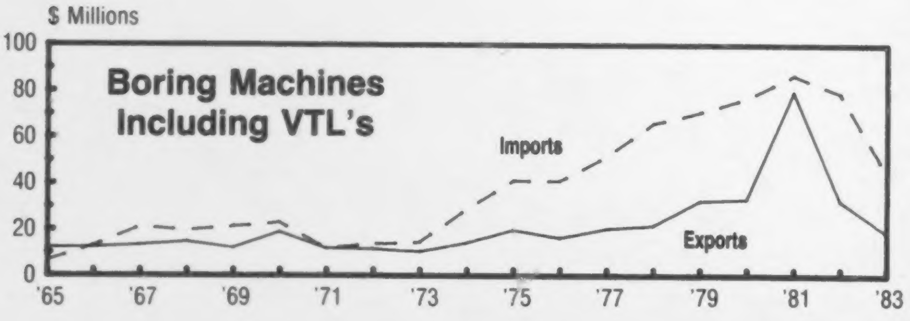
(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Manufacturers' export shipments exclude vertical turret lathes.

(c) Generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

The user should be aware that the minimum valuation of machines included in each of the three series shown on this and following tables has changed over time. "Total Exports" included all machines, regardless of value, until 1973. From 1974 through 1977 the series included only machines above $1,000. The minimum value was increased in 1978 to $2,500. "Manufacturers' Export Shipments" include machines valued less than $1,000 for all years shown. "Imports for Consumption" included all machines regardless of value through 1977. After 1977 only machines valued over $2,500 are included.



U.S. FOREIGN TRADE IN DRILLING MACHINES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1965	7,315	$ 8.6	612	$ 4.2	1,864	$ 2.3
1966	3,425	6.1	494	4.6	3,732	5.1
1967	3,427	10.9	685	7.2	5,304	7.6
1968	1,811	6.8	724	4.7	5,403	10.1
1969	2,413	9.5	1,153	5.6	6,146	6.0
1970	2,316	9.5	1,353	5.5	5,690	4.3
1971	2,173	8.5	672	5.0	4,744	2.9
1972	1,788	9.5	587	4.4	8,223	4.3
1973	2,889	12.6	NA	6.0E	8,541	.6
1974	883	12.9	NA	6.2	11,928	8.8
1975	860	13.9	NA	9.3	11,754	9.4
1976	815	13.6	NA	7.8	50,147(c)	15.3(c)
1977	782	14.6	NA	4.2	72,534(d)	19.7(d)
1978	688	13.8	NA	4.1	1,714	18.7
1979	1,762	16.8	NA	4.2	2,515	25.0
1980	546	22.2	NA	12.2	2,253	27.2
1981	566	24.4	NA	12.1	2,238	26.4
1982(r)	349	12.4	NA	10.8	1,317	20.7
1983(p)	233	8.3	NA	5.3	585	9.9

NA - Not Available. E - Estimate by NMTBA. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

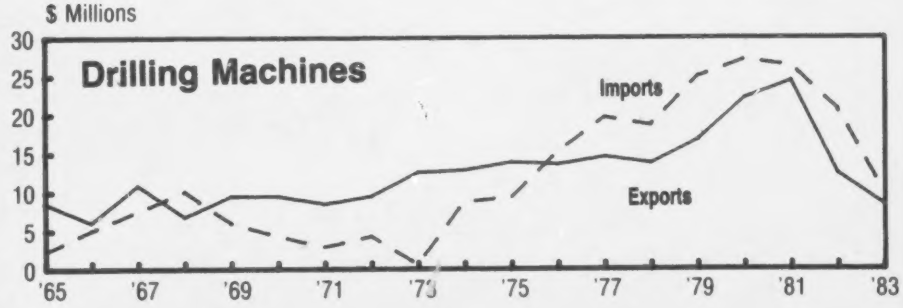
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 6,000 and dollar value about $12,000.

(d) The average unit value of imports from Norway, India, Japan and Taiwan, as reported by the U.S. Bureau of the Census, was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufactures' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GEAR CUTTING AND FINISHING MACHINES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1965	681	$16.1	509	$18.6	227	$ 3.3
1966	632	15.8	471	18.0	281	2.4
1967	852	23.6	692	29.4	279	3.6
1968	1,266	26.6	647	30.8	297	3.8
1969	841	24.4	615	32.2	320	2.5
1970	780	28.4	636	40.0	226	4.5
1971	1,030	30.0	588	36.4	132	3.7
1972	900	30.0	439	30.7	250	4.5
1973	718	27.5	NA	29.0E	134	4.7
1974	546	29.1	NA	40.0E	343	10.7
1975	499	31.4	NA	35.9	365	20.7
1976	552	25.7	NA	19.7E	198	16.9
1977	303	28.1	NA	D	200	13.5
1978	1,069(c)	47.0(c)	NA	D	494(d)	25.9(d)
1979	684(e)	43.8(e)	NA	D	466	33.1
1980	519(e)	61.2(e)	NA	D	415	41.3
1981	698(e)	80.1(e)	NA	D	367	37.0
1982	369(e)	37.4(e)	NA	D	281	25.8
1983(p)	65	11.8	NA	D	153	13.8

NA - Not Available. E - Estimate. D - Withheld to avoid disclosure. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

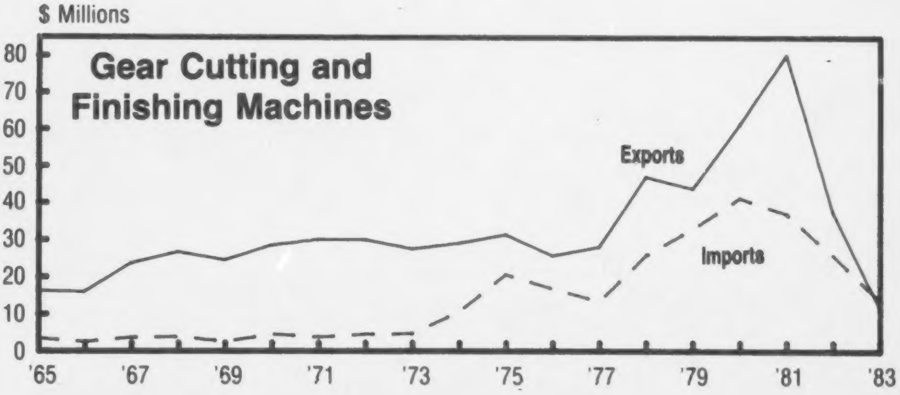
(c) Includes machines valued at less than $2,500.

(d) Includes used, rebuilt and machines valued less than $2,500 each.

(e) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: Imports exclude the value of parts. See note page 147 concerning description of categories.

Sources: Manufacturers export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GRINDING AND POLISHING MACHINES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1965	8,607	$ 37.4	3,575	$31.1	2,817	$ 6.5
1966	7,093	34.6	4,779	30.4	4,966	12.7
1967	7,128	32.0	4,155	29.7	4,934	16.0
1968	7,679	28.9	3,354	27.7	5,792	17.0
1969	7,906	41.5	3,396	37.0	5,352	16.6
1970	9,154	48.4	4,190	47.0	5,425	15.3
1971	8,094	32.7	3,677	29.4	3,175	11.6
1972	8,900	30.2	3,591	26.8	4,791	12.7
1973	9,883	50.5	NA	39.4	3,972	20.0
1974	3,266	53.0	NA	53.5	7,500	32.4
1975	3,022	53.0	NA	49.5	5,641	34.1
1976	2,537	57.3	NA	56.3	35,411(c)	32.2(c)
1977	4,124	40.1	NA	38.3	46,573(d)	39.2(d)
1978	2,455	80.8	NA	49.8	3,261	68.1
1979	2,487	65.9	NA	42.0	4,233	80.5
1980	1,979	85.1	NA	75.4	5,698	138.6
1981	2,694	126.5	NA	88.2	5,334	137.2
1982	1,877	71.1	NA	67.9	4,530	117.6
1983(p)	930	49.0	NA	54.4	3,282	89.6

NA - Not Available. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

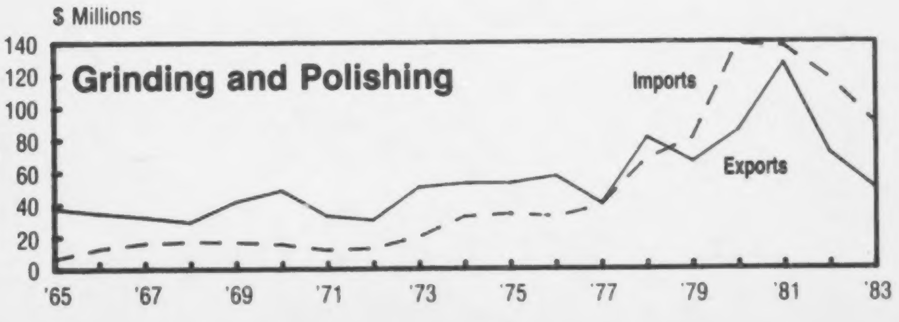
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 11,500 and the dollar value about $31,000.

(d) The average unit value of imports from Taiwan, as reported by the U.S. Bureau of the Census was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN LATHES, EXCLUDING VERTICAL TURRET LATHES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1965	4,072	$23.5	1,322	$20.1	8,736	$ 14.2
1966	2,740	19.8	1,131	18.6	14,819	37.2
1967	2,611	21.6	1,083	18.7	15,654	47.7
1968	2,161	18.8	683	15.3	11,452	38.1
1969	2,213	22.2	673	16.8	13,241	38.0
1970	2,871	29.2	842	29.3	12,082	27.9
1971	2,481	26.8	774	24.0	6,252	17.8
1972	2,957	21.1	500	19.2	5,578	22.9
1973	3,124	24.3	NA	20.3E	6,058	45.7
1974	1,921	31.0	NA	31.9E	8,187	73.1
1975	2,503	43.6	NA	55.0	6,745	77.0
1976	2,153	47.4	NA	45.9	7,801	77.0
1977	1,953	42.3	NA	35.6	11,527	113.0
1978	1,434	43.7	NA	37.1	12,280	219.3
1979	1,717	53.0	NA	45.5(d)	18,332	353.6
1980	1,107	67.1	NA	50.8(d)	16,710	380.0
1981	1,468	90.0	NA	58.5(d)	15,445	479.8
1982(r)	957	70.4	NA	36.8(d)	11,141	338.6
1983(p)	687	34.9	NA	D	6,662	165.7

NA - Not Available. E - Estimate by NMTBA. r - Revised. p - Preliminary. D - Withheld to avoid disclosure.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

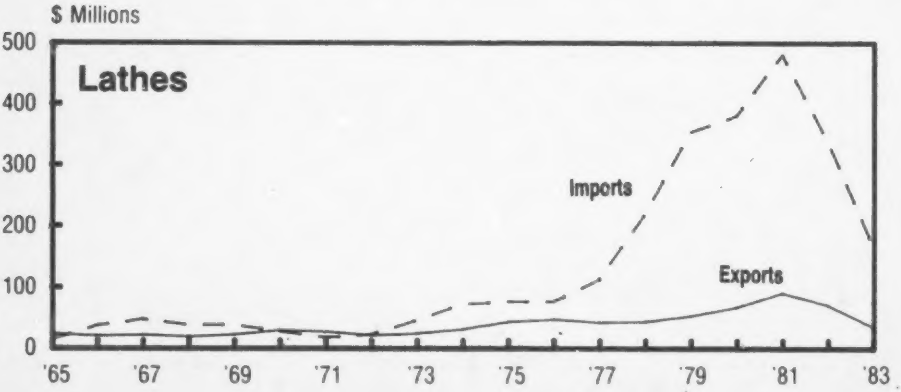
(b) Manufacturers' export shipments include vertical turret lathes.

(c) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(d) Does not include data for Vertical NC Lathes.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MILLING MACHINES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1965	988	$ 7.5	398	$ 8.8	1,128	$ 6.1
1966	1,072	8.9	338	10.2	3,405	17.4
1967	802	11.3	399	16.8	5,715	31.4
1968	848	17.9	304	12.1	5,428	30.6
1969	686	13.6	368	6.7	4,710	26.3
1970	779	19.1	456	12.2	2,047	13.4
1971	681	17.6	276	11.8	986	7.9
1972	589	13.6	416	5.3	1,441	7.5
1973	687	14.0	NA	8.0E	1,760	12.4
1974	776	14.8	NA	10.3	2,313	19.8
1975	804	20.6	NA	20.6	2,567	23.3
1976	799	14.4	NA	16.3E	2,413	25.9
1977	965	21.3	NA	D	3,720	27.9
1978	1,026	30.6	NA	D	3,364	47.7
1979	1,040	23.4	NA	20.1	6,650	83.1
1980	360	19.2	NA	27.9	11,573	138.1
1981	292	37.8	NA	33.4	10,434	124.7
1982	331	22.4	NA	21.0	5,985	87.7
1983 (p)	187	13.9	NA	7.7	3,660	52.5

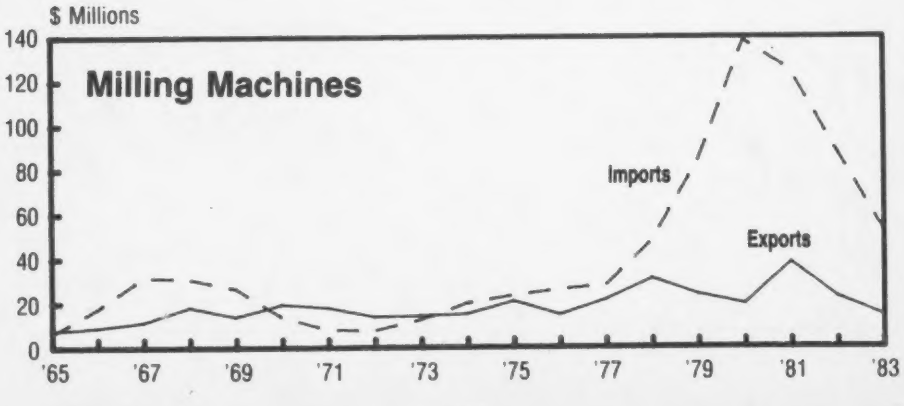
NA - Not Available. D - Withheld to avoid disclosure. E - Estimate by NMTBA. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MACHINING CENTERS
1979 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1979(c)	259	$45.4	NA	D	552	$ 39.6
1980	313	56.7	NA	$57.9	957	93.4
1981	316	53.4	NA	43.0	2,007	195.7
1982	195	34.0	NA	D	1,873	188.9
1983	102	13.3	NA	D	1,936	164.9

NA - Not Available. D - Withheld to avoid disclosure.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Data not available prior to 1979, Machining Centers had been included in "Other" category.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN "OTHER" METAL CUTTING MACHINE TOOLS (c,d)

1962 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1962	5,704	$ 32.4	2,667	$ 31.8	5,669	$ 4.4
1963	9,636	25.4	3,382	16.7	4,849	5.6
1964	8,487	34.6	3,167	36.3	5,965	6.7
1965	9,300	44.8	2,547	39.5	8,434	9.7
1966	10,692	38.5	4,029	39.5	26,340	17.1
1967	9,324	42.7	2,846	37.4	20,533	26.1
1968	11,635	22.3	2,250	26.2	13,550	23.1
1969	9,869	29.5	3,080	30.7	10,832	22.4
1970	11,777	53.0	3,464	43.7	18,509	16.4
1971	10,550	21.9	2,728	22.8	20,167	15.5
1972	9,201	21.8	3,073	23.2	20,704	17.1
1973	14,554	55.5	NA	63.8	9,251	23.3
1974	27,309	90.6	NA	78.0	26,444	35.5
1975	52,902	145.7	NA	146.7	21,266	42.5
1976	98,545	99.1	NA	90.7	42,064	37.1
1977	91,551	80.6	NA	66.4	74,175	53.3
1978	107,823	115.5	NA	92.0	465,218	136.5
1979	105,962	111.7	NA	74.0	597,946	147.5
1980	53,943	150.6	NA	173.2	582,050	169.7
1981	70,191	232.1	NA	68.7	901,398	204.5
1982	48,525	123.4	NA	46.5(e)	1,174,244	199.2
1983(p)	38,895	108.4	NA	23.2(e)	1,753,390	175.7

NA - Not Available. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) For 1978 and prior years Machining Centers were included in "Other". For 1979 Machining Centers are classified separately.

(d) Beginning in 1980 "Used and Rebuilt" machine tools are included in Total Exports and Imports.

(e) Does not include data for Station Type Machines.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN METAL FORMING MACHINES AND PARTS

1965 to Date

(Millions of Dollars)

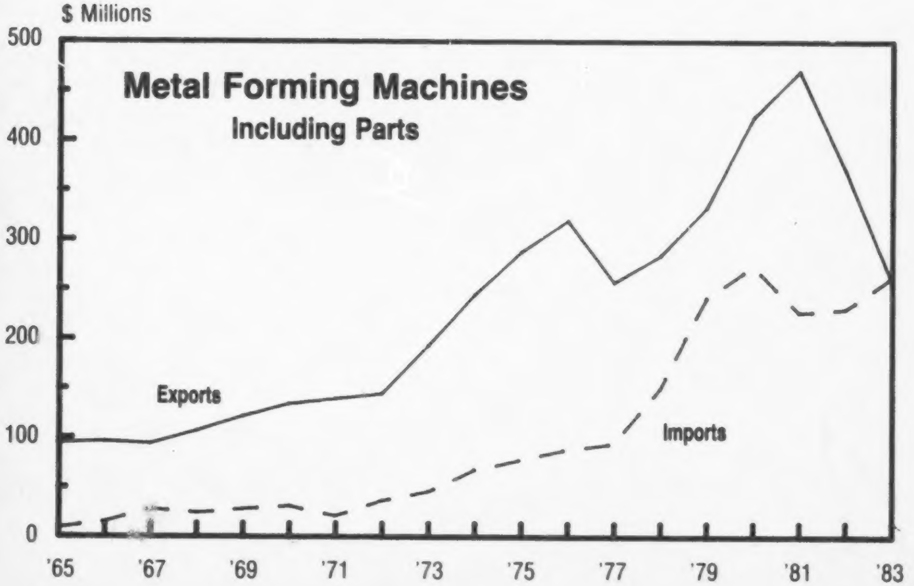
	Exports of Domestic Merchandise (Value at U.S. Port)								Imports for Consumption
Year	Total	Presses	Bending and Forming	Punching and Shearing	Forging Machines	Other New (b)	Used	Parts	Customs Import Value (a)
1965	$ 95.6	$26.1	$10.1	$ 5.6	$ 10.7	$ 20.2	$ 8.6	$ 14.3	$ 10.0
1966	97.3	22.5	11.2	9.8	6.0	22.6	4.9	20.3	16.2
1967	94.9	22.5	13.6	6.4	6.6	20.5	5.0	20.3	28.9
1968	107.8	33.9	10.2	5.9	5.5	25.4	3.6	23.3	25.2
1969	122.4	28.3	14.1	9.5	6.9	31.2	4.4	28.0	28.2
1970	135.1	25.9	11.0	6.5	8.3	34.2	6.1	43.1	32.4
1971	140.3	29.0	12.9	5.6	12.0	38.2	7.0	35.7	22.2
1972	145.4	34.0	11.9	5.9	11.2	37.6	11.0	33.7	37.6
1973	194.3	41.7	16.3	5.0	13.7	54.2	14.1	49.2	47.0
1974	245.7	58.6	21.3	9.4	10.8	64.9	14.5	66.3	69.0
1975	288.6	66.0	22.9	13.8	12.5	93.5	15.8	64.1	79.4
1976	320.0	80.1	26.0	20.2	13.5	101.3	15.6	63.3	89.7
1977	258.1	46.6	25.6	15.4	13.4	78.5	14.9	63.7	95.5
1978	284.9	32.3	39.2	13.7	21.0	73.9	13.6	91.2	150.7
1979	333.7	51.8	45.7	22.3	7.0	99.8	14.2	92.9	241.9
1980	424.6	69.7	44.5	44.8	16.4	95.9	18.6	134.7	274.7
1981	471.4	79.4	46.0	44.9	21.3	89.3	22.6	167.8	227.8
1982	371.9	53.8	35.1	32.9	15.3	61.7	12.5	160.5	231.3
1983	261.1	30.0	19.7	18.1	7.9	52.8	19.2	113.4	263.3

(a) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(b) Beginning in 1980 "Die Casting Machines" are included.

Note: See note on page 147 concerning description of categories.

Source: U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

Units and Value, 1959 to 1972, Value 1973 to Date

(Values in Millions of Dollars)

Year	Total		Presses		Bending and Forming		Punching and Shearing		Forging		Other (b)	
	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value
1959	2,166	$ 31.3	714	$15.1	793	$ 4.1	226	$ 3.0	96	$ 5.3	337	$ 3.6
1960	2,716	47.3	893	23.3	913	5.6	307	5.1	173	9.0	430	4.2
1961	2,758	55.2	934	30.7	930	4.7	283	6.8	166	8.9	445	4.1
1962	3,026	59.6	1,032	32.7	971	5.4	322	5.5	203	10.9	498	5.1
1963	2,955	42.3	943	20.1	1,135	7.6	362	6.5	112	4.7	403	3.4
1964	3,533	47.2	1,006	21.3	1,609	7.3	314	5.0	152	8.4	452	5.2
1965	3,338	44.1	751	18.4	1,600	5.6	284	4.3	148	8.4	555	7.5
1966	3,029	46.5	840	17.9	1,421	9.4	322	3.2	103	6.6	523	9.5
1967	2,824	50.2	962	24.5	933	5.6	324	5.9	98	6.3	507	7.9
1968	3,050	46.9	872	23.7	1,382	5.7	316	4.9	111	5.4	369	7.2
1969	3,380	39.9	943	14.3	1,503	5.1	536	6.5	141	6.1	257	7.9
1970	3,574	47.0	1,047	17.4	1,539	5.5	560	5.1	161	11.2	267	7.7
1971	4,491	51.9	915	22.3	1,287	5.7	461	3.7	186	13.0	1,642	7.1
1972	3,088	50.2	838	18.8	1,382	5.8	401	3.8	152	14.5	315	7.3
1973	NA	54.5	NA	21.2	NA	6.2	NA	3.4	NA	13.2	NA	10.5
1974	NA	78.4	NA	D	NA	15.7	NA	8.3	NA	D	NA	18.6
1975	NA	98.6	NA	D	NA	14.9	NA	14.7	NA	D	NA	16.8
1976	NA	105.8	NA	D	NA	16.5	NA	17.4	NA	D	NA	16.8
1977	NA	71.7	NA	D	NA	13.5	NA	16.6	NA	D	NA	12.9
1978	NA	112.8	NA	D	NA	17.4	NA	14.7	NA	D	NA	18.7
1979	NA	112.0	NA	27.7	NA	24.5	NA	16.8	NA	D	NA	D
1980	NA	152.0	NA	35.2	NA	34.5	NA	32.6	NA	D	NA	D
1981	NA	156.7	NA	43.1	NA	29.8	NA	29.5	NA	D	NA	D
1982(r)	NA	117.8	NA	36.3	NA	19.3	NA	16.2	NA	D	NA	D
1983(p)	NA	52.9	NA	13.1	NA	13.0	NA	9.9	NA	D	NA	D

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Complete new machines as shipped, including accessories, etc., ordered and shipped with the machines, f.o.b. factory.

(b) Some metalworking machines, other than metal forming type machines, are included prior to 1968.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

The export figures for machine tools shown in this table and in tables and graphs in Chapter 4 are substantially lower than those on the preceding pages. This is so for several reasons: first, the data for Manufacturers' Exports cover only new and complete machine tools; second, they represent the manufacturer's selling price at the factory (F.O.B.); third, they exclude machine tools which are sold domestically but exported later by the buyer. The two sources for the tables mentioned above, NMTBA (Chapter 4) and the "Current Industrial Reports" (above), differ although they are based on the same sources. The reasons are the extent of coverage and different reporting practices. See Chapter 4 Introduction for a detailed explanation.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF NEW MACHINE TOOLS (a)

Units and Value, 1959 to Date

(Values in Millions of Dollars)

Year	Total (b)		Metal Cutting		Metal Forming (b)	
	Units	Value	Units	Value	Units	Value
1959	9,867	$ 80.8	7,701	$ 49.5	2,166	$ 31.3
1960	13,203	157.5	10,487	110.2	2,716	47.3
1961	14,080	207.2	11,322	152.0	2,758	55.2
1962	14,520	216.1	11,494	156.5	3,026	59.6
1963	15,109	144.4	12,154	102.1	2,955	42.3
1964	14,110	198.6	10,577	151.4	3,533	47.2
1965	12,475	171.3	9,137	127.1	3,338	44.1
1966	14,634	173.2	11,425	126.7	3,209	46.5
1967	12,861	194.1	10.037	143.9	2,824	50.2
1968	11,462	174.5	8,109	121.2	3,353	53.3
1969	13,083	181.5	9,406	135.2	3,677	46.3
1970	15,061	238.8	11,099	185.8	3,962	52.9
1971	13,634	191.0	8,854	133.2	4,760	57.7
1972	[illegible],093	171.1	8,677	112.6	3,416	58.5
1973	NA	224.7	NA	170.2	NA	54.5
1974	NA	310.2	NA	231.8	NA	78.4
1975	NA	423.6	NA	325.0	NA	98.6
1976	NA	352.3	NA	246.5	NA	105.8
1977	NA	279.1	NA	207.5	NA	71.7
1978	NA	371.0	NA	258.2	NA	112.8
1979	NA	395.6	NA	283.5	NA	112.0
1980	NA	630.8	NA	482.3	NA	148.5
1981	NA	675.0	NA	518.3	NA	156.7
1982(r)	NA	418.9	NA	301.1	NA	117.8
1983(p)	NA	208.6	NA	155.7	NA	52.9

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete machines as shipped, including accessories, etc., ordered and shipped with the machinery at manufacturers' selling price, f.o.b, factory. Excludes rebuilt machines, machines designed primarily for home workshops, laboratories, garages, etc., and parts.

(b) Includes some metalworking type machines other than machine tools prior to 1973.

Note: See note on page 156.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF SELECTED MACHINE TOOLS

1970 to 1978

(Values in Thousands of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978
METAL CUTTING									
Boring									
Vertical Boring and Turning Mills, Standard Type	NA	NA	NA	NA	NA	NA	NA	NA	NA
Precision Boring	$ 1,918	$2,089	D	$ 1,036	$ 5,565	$ 4,755	$ 1,973	$ 1644	$ 1,260
Gear Cutting									
Gear Hobbers	431	8,749	D	10,988	9,914	9,802	5,076	6,808	9,501
Gear Tooth Finishing	9,176								
Grinding									
External Cylindrical									
Plain	2,816	7,688	$8,535	8,394	15,046	17,796	2,710	14,786	2,844
Roll and Centerless	3,416						19,665		12,205
All Other	10,064								
Surface Grinding	5,175	2,260	D	5,422	5,235	7,426	5,096	6,801	7,829
Special Tool & Cutter Grinding	2,553	2,854	1,996	920	D	3,897	5,897	15,779	4,856
Honing	1,694	1,015	D	1,559	2,077				
Lathes									
Manufacturing and Tool Room (Up to 36")	1,089	1,900	1,789	1,959	4,111	4,985	5,430	3,143	2,010
Automatic Chucking									
Single Spindle	1,487	1,558	1,660	1,518	2,742	8,514	5,744	4,817	10,181
Multiple Spindle	9,502	7,159	3,173	5,229	4,203	4,882	5,493	3,193	
Screw (bar) Machines	7,165	6,637	6,194	6,693	7,474	10,707	7,974	7,813	2,451
Milling									
Profile and Duplicator	5,074	3,062	1,643	2,499	1,645	2,992	D	D	2,325
Broaching	3,096	1,711	541	3,165	2,142	5,891	3,052	D	8,368
Sawing and Cut-off Machines	NA	NA	4,121	4,541	3,402	10,351	6,541	3,399	8,056
Transfer Machines	18,807	6,533	9,755	39,494	31,240	93,541	34,406	12,423	27,988
METAL FORMING									
Power Shearing									
Plate	2,322	765	1,554	2,699	3,303	8,023	7,942	7,944	5,044
Rotary								143	191
Bending and Forming, Power									
Bending Rolls, Sheet & Plate	800	1,799	2,313	2,348	9,194	3,592	3,413	3,936	2,727
Bending Brakes and Folders	1,025								
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mechanical Presses									
Vertical Straight-sided and Arch Frame (Excl. Knuckle Joint)									
Single Action, Single Point, 201 Tons and Over	940	2,256	2,766	1,256	D	5,452	D	D	D
Single Action, Two Point, 500 Tons and Under (a)	1,327								
Hydraulic and Pneumatic Extrusion Presses	7,120	2,194	D	1,905	D	D	D	D	D

NA - Not Available. D - Withheld to avoid disclosing individual companies' data.

(a) Beginning in 1973: Single Action, Two Point, 300 Tons and Under.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF SELECTED MACHINE TOOLS

1979 to Date

(Values in Millions of Dollars)

Machine Classification	1979	1980	1981	1980(r)	1983(p)
METAL CUTTING MACHINE TOOLS	283.5	482.3	518.3	301.1	155.7
Boring Machines	9.5	17.7	D	14.9	D
Drilling Machines	4.2	12.2	12.1	10.8	5.3
Valued under $2,500	.3	.2	.2	D	D
All other Drilling Machines	3.9	12.0	12.0	D	D
Gear Cutting Machines	D	D	D	D	D
Grinding, Polishing, Buffing, Honing & Lapping Machines	42.0	75.4	88.2	67.9	54.4
Valued under $2,500	.7	.6	.6	.4	.4
External Cylindrical Grinding Plain (incl. angular wheel type) & Universal	6.3	D	10.4	10.3	D
Roll, Centerless, & Chuck type grinders	D	D	30.4	26.4	21.7
All other External types	5.7	D			
Internal Cylindrical Grinding Surface Grinding Machines:					
Rotary & Reciprocating table type	5.4	10.3	10.3	9.2	D
All other Surface Grinders	D	2.0		.9	2.7
All other Grinding Machines	D	15.3	36.5	4.4	5.0
Honing & Lapping Machines	5.6	18.3		16.2	14.9
Polishing & Buffing Machines					
Horizontal NC Turning Machines	16.9	21.6	21.2	17.2	D
Vertical NC Turning Machines	D	D	D	2.5	D
Non-NC Turning Machines	28.7	29.2	37.3	17.1	11.8
Valued under $2,500	1.4	1.5	D	D	D
Engine or Tool Room lathes, swing over cross slide	D	D	3.1	2.2	D
Turret lathes, horizontal	D	D			
Automatic lathes			6.4	D	D
Single Spindle	D	D			
Multiple Spindle	10.5	14.7	26.3	D	D
All other Horizontal lathes	D	D	D	4.6	D
All other Vertical lathes					
Milling Machines	20.1	27.9	33.4	21.0	7.7
Machining Centers	D	57.9	43.0	D	D
Drill, Mill, Bore, manual tool change	D	D	D	D	D
Drill, Mill, Bore, (ATC) Vertical	12.3	18.4	15.0	D	D
Horizontal	33.7	36.2	24.4	19.3	D
All other Machining Centers	D	D	D	D	0
Station Type Machines	47.4	133.9	111.0	D	0
Other Metal Cutting Machines	26.6	39.3	57.8	46.5	23.2

D - Withheld to avoid disclosure. r - Revised. p - Preliminary

Source: U.S. Commerce Department, Current Industrial Reports, MQ35W.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS

1979 to DATE

(Values in Millions of Dollars)

Machine Classification	1979	1980	1981	1982(r)	1983(p)
METAL FORMING MACHINE TOOLS	112.0	148.5	156.7	117.8	52.9
Punching, Shearing, Bending and Forming Machines	41.3	63.2	59.3	35.5	22.9
All Punching & Shearing valued under $2,500	.3	.5	.6	.3	.3
Punches, incl. combination Punching & Shearing Machines	11.7	21.7		3.2	8.2
Punching Machines fixed position and two axes positioning table		10.3	19.6	7.0	
Plate Shearing Machines	4.8		9.3	5.7	1.4
Other Punching & Shearing					
All Bending & Forming valued under $2,500	.7	1.0	.9	.7	.4
Press Brakes	11.9	15.5	16.6	8.7	6.0
Bending Rolls					
Rotary Bending & Forming Machines (incl. Rotary Head)					
Ram & Press Bending Machines.					
Other Bending & Forming	11.9	14.2	12.3	9.9	6.6
Presses, except forgings	27.7	35.1	43.1	36.3	13.1
Presses valued under $2,500	.4	.7	.2	.4	.3
Mechanical Presses:					
Open Back Inclinable	2.1	D	3.8	D	D
Other Mechanical Presses	16.7	22.7	25.0	15.4	5.9
Hydraulic Presses	8.6	D	14.3	D	D
Forging Machines	D	D	D	D	D
Other Metal Forming Machines	D	D	D	D	D
Thread Rolling	D	D	D	D	D
Metal Container Making Machinery	NA	NA	NA	10.3(a)	7.5(a)
Die Casting	D	D	D	D	D
Riveting Machines	D	D	D	D	D
Other Metal Forming Machines	16.2	25.7	19.4	7.7	4.3

NA - Not Available. D - Withheld to avoid disclosure. r - Revised. p - Preliminary.

(a) - "Metal Container Making Machinery" was included with "Other Metal Forming Machines" prior to 1982.

Source: U.S. Commerce Department, Current Industrial Reports, MQ35W.

6

WORLD MACHINE TOOL INDUSTRY

For many years American Machinist magazine has been publishing estimates of the world's machine tool production and trade. These estimates, which cover 33 countries, come from unofficial sources and are revised for previous years when "official" figures become available. Whenever possible, data include complete machine tools only and exclude parts and attachments. However, for some countries it is not clear if the totals include or exclude the value of parts.

Several years ago, the trade associations of 14 European countries (co-operating through a group called CECIMO) and the United States, Japanese, and Indian trade associations agreed to develop a uniform international statistical reporting system. Under this system, the production, exports and imports of the participating countries are reported for seven major groups of metal cutting machine tools and three major groups of metal forming machine tools. Data by machine type for 1982 are included in this chapter. The machine tool production of the 16 countries totaled about $15.1 billion in 1982.

Harmonization

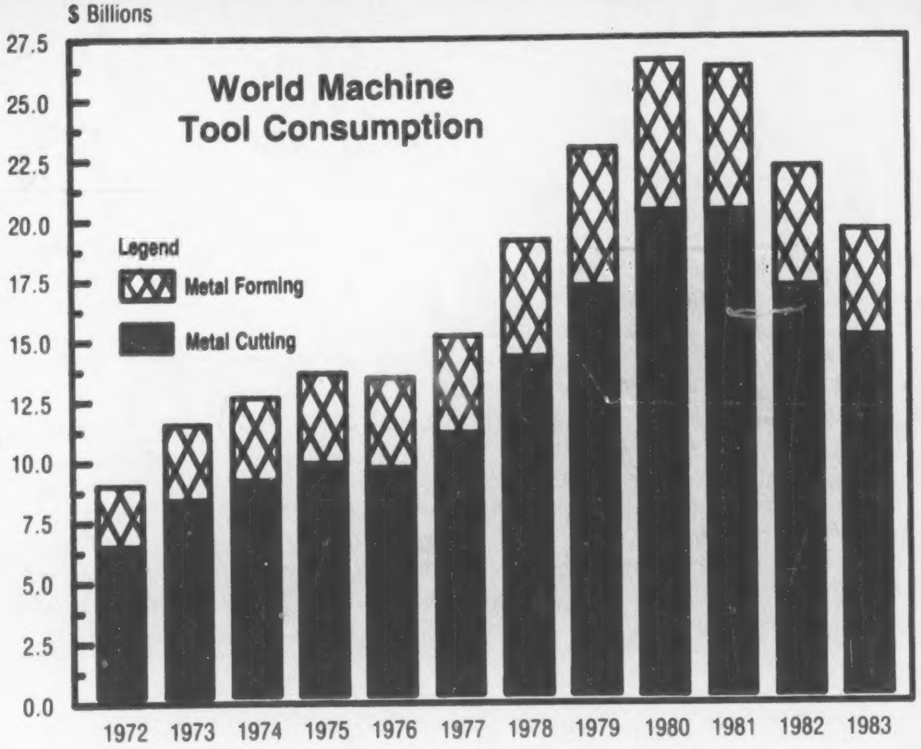
The United States is participating, through its International Trade Commission, in the technical work of the Harmonized Systems Committee of the Customs Co-Operation Council (CCC) in Brussels. The objective of the work of the Customs Co-Operation Council is to extend the Brussels Tariff Nomenclature (BTN) into a worldwide, uniform nomenclature for use by customs officials. Such a system has obvious advantages for market analysis and for a variety of other purposes.

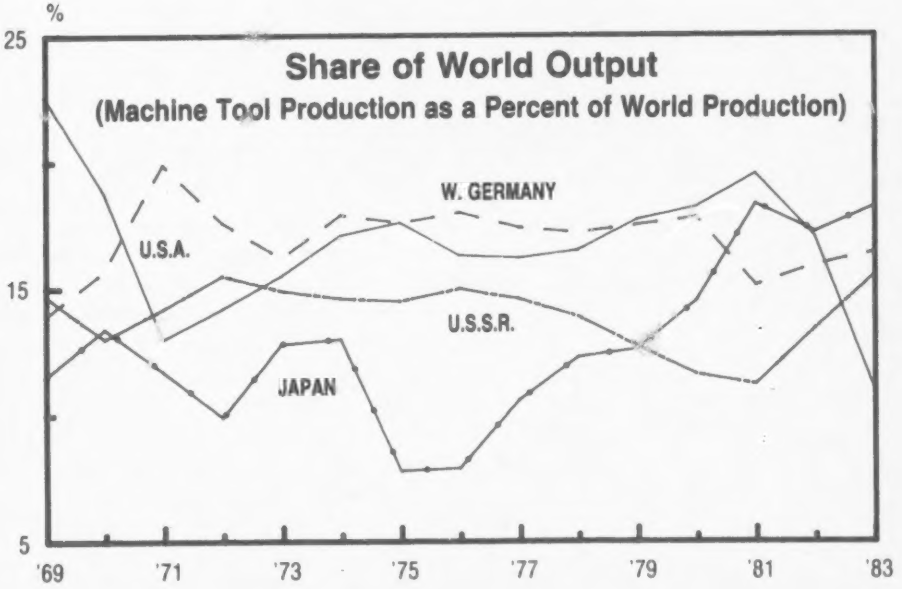
Machine tools are part of Chapter 84 which is currently under consideration. The International Trade Commission has presented proposed machine tool import and export classifications to the CCC for consideration. Discussions by the CCC are currently in progress but no significant changes have yet been ratified by the Council.

Foreign Exchange Rates

With the "floating" of many world currencies, the value measurement of production and trade statistics has become increasingly difficult and confusing. Foreign data in this Handbook have been converted into dollars on the basis of the trade conversion factors given in the International Monetary Fund's "International Financial Statistics."

In the uniform international statistical reporting system for CECIMO, each participating country reports its data in Swiss Francs. In this chapter, these data have been converted into dollars with the conversion rates below the tables. These tables can be identified with the source as International Statistics on Machine Tools.


$ Billions
World Machine Tool Consumption
Legend
▨ Metal Forming
■ Metal Cutting
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983


%
Share of World Output
(Machine Tool Production as a Percent of World Production)
25
15
5
W. GERMANY
U.S.A.
U.S.S.R.
JAPAN
'69
'71
'73
'75
'77
'79
'81
'83

WORLD MACHINE TOOL PRODUCTION, 1967 to Date

(Millions of U.S. Dollars) (a)

	Total	Metal Cutting	Metal Forming
1967	$ 6,624.2	$ 4,894.3	$1,678.7
1968	6,543.3	4,941.2	1,552.6
1969	7,474.6	5,590.9	1,833.7
1970	8,268.2	6,069.2	2,142.0
1971	8,148.9	5,951.5	2,192.4
1972	8,965.1	6,433.1	2,532.0
1973	11,548.1	8,393.2	3,154.9
1974	12,656.3	9,190.0	3,466.3
1975	13,640.0	9,844.3	3,795.7
1976	13,387.4	9,672.5	3,714.9
1977	15,126.5	11,079.8	4,046.7
1978	19,088.4	14,192.8	4,889.4
1979	22,925.1	17,170.1	5,755.0
1980	26,501.3	20,268.4	6,232.8
1981	26,209.5	20,274.9	5,934.5
1982(r)	22,071.3	17,171.4	4,957.0
1983(p)	19,422.3	15,024.2	4,397.7

p - Preliminary. r - Revised.

(a) Metal Cutting and Metal Forming may add to less than the total because a breakdown was not available for some countries.

Source: McGraw-Hill, Inc. "American Machinist," Uniform International Statistics on Machine Tools, and statistics reported by individual countries' machine tool associations.

For many years, the "American Machinist" has published estimates of world machine tool production. When it was possible to do so, parts and attachments were excluded. Beginning with 1974, the trade associations of 13 European countries, the United States, Japan, and India have been collecting statistics on production, exports, and imports on a uniform basis. For details, see chapter introduction.

LEADING MACHINE TOOL CONSUMING NATIONS (a)

1983 and 1982

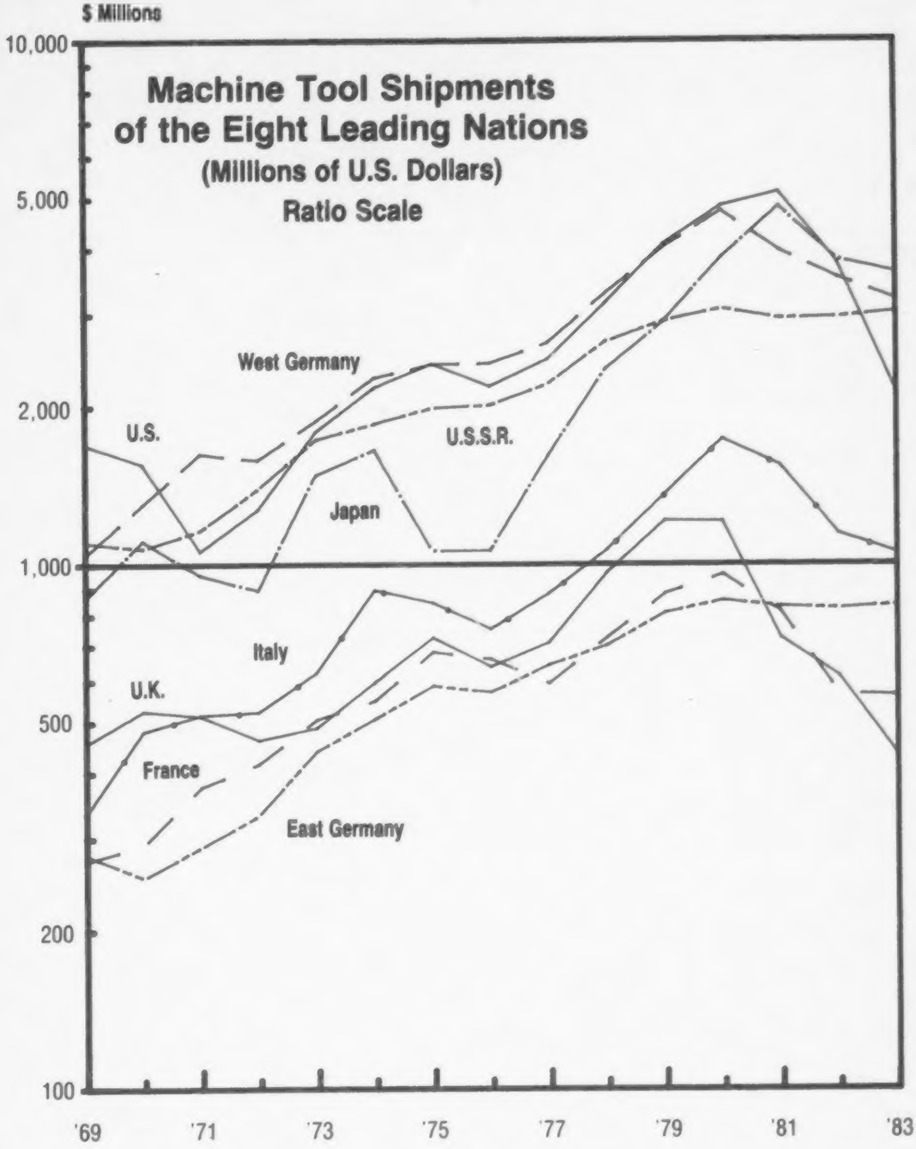
(Millions of U.S. Dollars)

Country	1983	1982	Percent Change(b)	
			U.S. Dollars	Nat'l. Currency
1. U.S.S.R.	$4,018.8	$3,876.5	3.7%	5.2%
2. United States	2,694.7	4,392.0	−38.6%	−38.6%
3. Japan	2,454.9	2,751.7	−10.8%	−14.9%
4. FRG (West Germany)	1,755.8	1,845.5	−4.9%	0.1%
5. Italy	626.3	707.3	−11.5%	−0.6%
6. France	616.0	748.9	−17.7%	−4.6%
7. PRC (China)	578.1	575.0	0.5%	5.1%
8. Rumania	529.7	668.5	−20.8%	−10.0%
9. United Kingdom	430.3	577.4	−25.5%	−14.0%
10. Canada	385.1	365.3	5.4%	5.3%
11. GDR (East Germany)	364.1	375.5	−3.0%	2.0%
12. Bulgaria	302.2	275.6	9.7%	9.7%
13. Korea	290.0	194.0	49.5%	58.6%
14. India	238.9	318.6	−25.0%	−19.9%
15. Czechoslovakia	224.9	159.2	41.3%	47.6%
16. Switzerland	211.9	259.8	−18.4%	−15.7%
17. Yugoslavia	211.8	288.4	−26.6%	35.6%
18. Sweden	192.6	201.9	−4.6%	16.4%
19. Spain	175.0	261.4	−33.1%	−12.6%
20. Taiwan	170.0	140.9	20.7%	20.7%
21. Australia	169.3	201.1	−15.8%	−5.1%
22. Hungary	156.1	154.2	1.2%	17.9%
23. Austria	151.4	187.3	−19.2%	−14.9%
24. South Africa	149.4	245.5	−39.1%	−37.5%

(a) Machine tool consumption is domestic production plus imports and minus exports.

(b) Percent change calculations based on U.S. dollars include the effect of changes in currency conversion rates. Percent change calculations based on national currency differ for some countries. These percent change values are not influenced by currency conversion rates and, therefore, may more realistically reflect changes in a nation's machine tool consumption.

Source: McGraw-Hill, Inc., "American Machinist," International Statistics on Machine Tools and NMBTA.



Machine Tool Shipments of the Eight Leading Nations

(Millions of U.S. Dollars)

Ratio Scale

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1983 (ESTIMATED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 3,538.0	$ 2,953.6	$ 584.4	$1,254.1	$ 171.0
2. West Germany	3,193.5	2,251.6	941.9	1,870.4	432.7
3. Soviet Union*	3,019.8	2,372.8	646.9	243.0(c)	1,242.0(c)
4. United States	2,132.6	1,584.9	547.7	359.0	921.1
5. Italy	1,047.9	722.9(a)	325.0(a)	603.4	181.8
6. GDR (East Germany)	835.2	636.6	198.6	662.1	191.0
7. Switzerland	766.5	711.7	54.8	670.9	116.3
8. France	560.1	441.0(a)	119.1(a)	295.2	351.1
9. Rumania*	487.7(c)	444.4(c)	43.3(c)	114.5(c)	156.5(c)
10. PRC (China)*	472.6(c)	351.7(c)	120.9(c)	25.1(c)	130.6(c)
11. United Kingdom	432.9	360.1	72.8	289.2	286.6
12. Czechoslovakia	382.3	331.8	50.5	264.2	106.8
13. Bulgaria*	240.5	216.4	24.0	234.0	295.7
14. Canada	231.3	169.2	62.1	54.6	208.4
15. Korea	210.0	132.0	78.0	65.0	145.0
16. Yugoslavia	208.5	146.6	61.9	133.9	137.2
17. Taiwan	193.6	181.2	12.4	137.7	114.1
18. Spain	188.2	130.7(a)	57.5(a)	99.4	86.2
19. Sweden	179.9	108.2	71.6	138.5	151.2
20. India	174.7	144.9	29.8	18.3	82.5
21. Austria	142.5	80.5	62.0	114.0	122.9
22. Hungary*	131.0	114.5	16.5	98.6	123.7
23. Brazil	123.8	92.5	31.3	18.5	42.6
24. Poland*	120.8(c)	105.2(c)	15.6(c)	42.1(c)	44.0(c)
25. Belgium	90.9	31.8	59.1	105.0	99.3
26. Israel	70.0	55.0	15.0	23.0	90.0
27. Australia	50.5(j)	32.5(j)	18.0(j)	8.8(j)	127.6(j)
28. Denmark	48.7	30.6	18.0	33.4	26.2
29. Singapore	36.7(c)	31.6(c)	5.1(c)	20.1(c)	98.0(c)
30. Argentina	31.8(c)	16.9(c)	14.9(c)	14.0(c)	42.3(c)
31. Netherlands	25.1	12.9	12.2	59.8	83.6
32. Mexico	21.0(c)	12.0(c)	9.0(c)	2.0(c)	50.0(c)
33. South Africa	14.4	5.4	9.0	0.0	135.0
34. Portugal	14.0(c)	6.0(c)	8.0(c)	2.8(c)	45.2(c)
35. Hong Kong	5.3(c)	4.5(c)	0.8(c)	1.0	8.3
Total	19,422.3	15,024.2	4,397.7	8,075.6	6,646.5

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.
(c) Rough estimate from fragmentary data.
(j) Year ended June 30.

*Countries with controlled currencies. The Soviet Union has been converted at 80% of the official rate; GDR has been converted at 65% of the current FRG rate; Czechoslovakia, Hungary, Poland and Romania were at the official rate; China and Bulgaria are rough estimates based on estimates of the amount of production.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. Most estimates for 1983 have been converted at International Monetary Fund rates for the first nine months of 1983 plus estimates of bank transfer rates for the last three months; the rest have been converted at 1983 average rates.

Notes: Whenever possible, data include machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

Source: McGraw-Hill, Inc., "American Machinist," and NMTBA.

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1982 (REVISED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 3,794.8	$ 3,141.5	$ 653.3	$1,263.4	$ 220.3
2. United States	3,748.9	2,922.2	826.7	574.6	1,217.7
3. West Germany	3,504.8	2,425.8	1,079.0	2,128.9	469.6
4. Soviet Union*	2,952.7	2,272.0	680.6	238.2	1,162.0
5. Italy	1,138.6	808.1(a)	330.5(a)	639.9	208.6
6. GDR (East Germany)*	821.5	627.9	193.7	642.9	196.9
7. Switzerland	816.1	758.0	58.1	714.0	157.7
8. Rumania*	615.5(u)	560.9(u)	54.6(u)	144.5(u)	197.5(u)
9. United Kingdom	609.0	504.7	104.3	436.0	404.4
10. France	564.8	495.1	126.9	295.2	479.3
11. PRC (China)*	470.0(u)	350.0(u)	120.0(u)	25.0(u)	130.0(u)
12. Czechoslovakia	308.2	266.3	41.9	275.8	126.8
13. Yugoslavia	284.5	190.6	93.9	136.4	140.3
14. Canada	264.0	205.6	58.4	154.4	255.7
15. Spain	260.2	197.7	62.5	175.5	176.7
16. Bulgaria*	221.0	198.9	22.1	207.3	261.9
17. Taiwan	185.6	174.3	11.3	124.4	79.7
18. India	182.9	159.9	23.0	18.2	153.9
19. Brazil	172.5	128.9	43.6	20.7	85.2
20. Sweden	165.1	97.5	67.6	114.4	151.2
21. Korea	158.0	115.0	43.0	61.0	97.0
22. Poland*	151.0(c)	131.8(c)	19.2(c)	52.6(c)	120.0(c)
23. Hungary*	128.2	113.0	15.2	96.2	122.2
24. Austria	127.2	79.2	48.0	121.0	181.1
25. Belgium	101.0	35.5	65.5	116.0	116.8
26. Israel	70.0	55.0	15.0	26.8	88.2
27. Australia	43.8(j)	18.1(j)	25.7(j)	5.5(j)	162.8(j)
28. Netherlands	42.8	25.8	17.0	66.2	93.6
29. Singapore	40.2(u)	34.6(u)	5.6(u)	22.0(u)	107.4(u)
32. Denmark	35.5	29.6(a)	5.9(a)	41.8	45.0
31. Argentina	35.3(u)	18.8(u)	16.5(u)	15.6(u)	47.0(u)
32. Mexico	19.0	10.0	9.0	2.0	320.0
33. Portugal	16.2(u)	7.1(u)	9.1(u)	4.1(u)	53.9(u)
34. South Africa	14.8	5.5	9.2	0.0	230.7
35. Hong Kong	7.6(c)	6.5(c)	1.1(c)	1.4	11.0
Total	22,071.3	17,171.4	4,957.0	8,961.9	8,072.1

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.
(c) Rough estimate from fragmentary data.
(j) Year ended June 30.
(u) Unrevised.

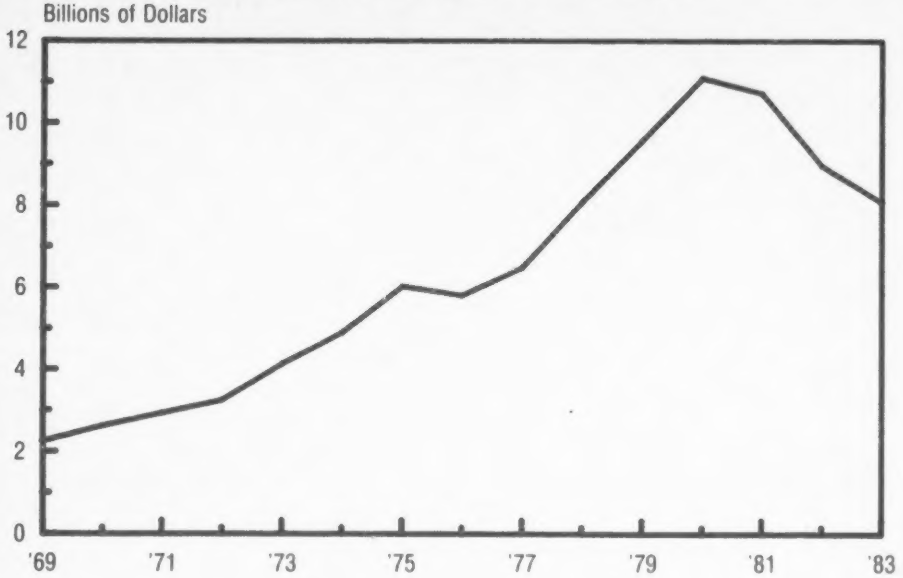
* - Countries with controlled currencies. The Soviet Union has been converted at 80%, of the official rate; GDR has been converted at 65% of the current FRG rate; Czechoslovakia, Hungary, Poland, Romania were at the official rate; China and Bulgaria are rough estimates based on estimates of the amount of production.

Exchange Rates: All free market currencies have been converted at rates for the period covered. Values were converted at average market rates for 1982 as reported by the International Monetary Fund.

Notes: Whenever possible, data include complete machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

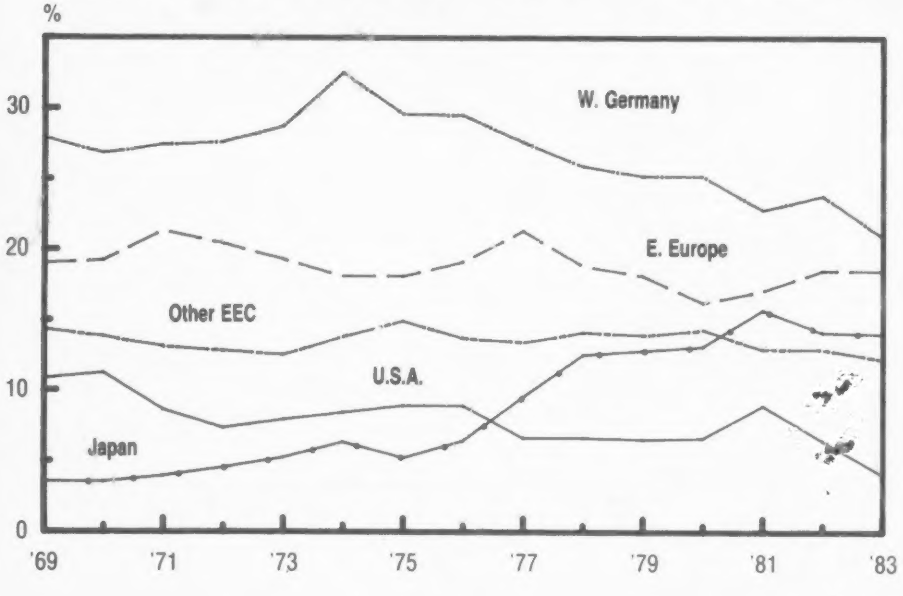
Source: McGraw-Hill, Inc., "American Machinist," and NMTBA.

World Exports of Machine Tools



Share of World Exports

(Machine Tool Exports as a Percentage of Total World Exports)



PRODUCTION, EXPORTS AND IMPORTS OF MACHINE TOOLS
Selected Countries, 1980 to 1982
(Millions of U.S. Dollars)

Country	Production			Exports			Imports		
	1980	1981	1982	1980	1981	1982	1980	1981	1982
Austria	$ 127.8	$ 108.4	$ 127.2	$ 131.3	$ 108.4	$ 121.0	$ 165.6	$ 292.1	$ 181.1
Belgium	137.2	103.3	101.0	135.1	119.2	116.2	205.6	139.5	116.9
Denmark	49.1*	41.6	35.3	85.9*	47.9	41.8	92.6*	45.1	45.0
France	953.9	809.4	564.8	516.1	390.4	295.0	554.0	566.5	479.3
India	162.7	184.6	182.9	17.5	17.1	18.2	63.6	86.6	153.9E
Italy	1,726.0	1,512.1	1,138.6	847.6	795.2	638.1	356.1	300.0	208.5
Japan	3,830.3	4,796.9	3,796.4	1,461.0	1,692.9	1,272.5	221.4	215.7	220.4
Netherlands	74.4	60.5	47.6	91.6	74.2	66.2	155.0	110.6	93.6
Norway	7.1*E	6.4E	NA	4.5*	4.2	4.6	69.6*	62.0	47.7
Portugal	28.0*E	16.2	15.7E	6.6*E	4.1	3.1E	30.0*E	53.9	37.7E
Spain	327.7	319.6	259.4	228.2	206.8	174.9	103.2	141.8	176.1
Sweden	231.7	204.8	179.9E	180.9	164.3	138.3	184.9	191.6	151.2
Switzerland	994.0	846.2	816.1	869.9	740.3	714.2	320.0*	188.9	157.6
United Kingdom	1,201.7	720.7	607.7	674.2	577.7E	477.7	622.2	432.6	408.8
United States	4,815.0	5,131.0	3,745.0	735.0	949.0	574.0	1,260.0	1,432.0	1,218.0
West Germany	4,708.1	3,953.1	3,505.0	2,964.7	2,584.9	2,206.4	802.2	616.4	488.6

NA - Not Available.   E - Estimate.   * Includes Parts and Accessories.

Exchange Rate: 1980 $ = 1.6757 Swiss Francs; 1981 $1 = 1.964 Swiss Francs; 1982 $1 = 2.0303 Swiss Francs.

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comité Européen de Coopération des Industries de la Machine Outil); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA.

PRODUCTION, EXPORTS AND IMPORTS OF MACHINE TOOLS
Selected Countries, 1982
(Millions of U.S. Dollars)

Country	Production			Exports			Imports		
	Total	Cutting	Forming	Total	Cutting	Forming	Total	Cutting	Forming
Austria	$ 127.2	$ 79.2	$ 48.0	$ 121.0	$ 74.0	$ 47.0	$ 181.1	$ 113.8	$ 67.3
Belgium	101.0	35.5	65.5	116.0	65.8	50.2	116.8	84.8	32.0
Denmark	35.5	NA	NA	41.8	NA	NA	45.0	NA	NA
France	564.8	495.1	126.9	295.0	183.3	111.7	479.3	348.1	131.2
India	182.9	159.9	23.0	18.2	16.5	1.7	153.9E	NA	NA
Italy	1,138.6	808.1	330.5	638.0	451.7	186.3	208.5	155.3	53.2
Japan	3,796.4	3,143.1	653.3	1,272.5	994.1	278.5	220.4	175.1	45.3
Netherlands	47.6	NA	NA	66.2	33.7	32.5	93.6	61.7	31.9
Norway	NA	NA	NA	4.6	NA	NA	47.7	NA	NA
Portugal	15.7E	NA	NA	3.1E	NA	NA	37.7E	NA	NA
Spain	259.4	197.1	62.3	174.9	124.2	50.7	176.1	91.0	85.1
Sweden	179.9E	108.3E	71.6E	138.3	71.5	66.8	151.2	114.9	36.2
Switzerland	816.1	758.0	58.1	714.2	682.2	32.0	157.6	NA	NA
United Kingdom	607.7	500.1	107.6	477.7	359.5	118.2	408.8	330.2	78.6
United States	3,745.0	2,919.0	826.0	574.0	375.0	199.0	1,218.0	1,026.0	192.0
West Germany	3,505.0	2,429.0	1,076.0	2,206.4	1,435.8	770.6	488.6	353.9	134.7

NA - Not Availabie.   E - Estimate.

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comité Européen de Coopération des Industries de le Machine Outil); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA.

The Uniform International Statistics prepared by CECIMO indicate 1982 production by 16 countries of $15.1 billion of machine tools. Individual country figures on the following pages may differ because of problems in conversion of exchange rates, differences in reporting practices, etc.

PRODUCTION OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1982
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 79.2	9.5	(a)	$ 0.0	$ 8.7	$ 30.1	$ 17.9	$ 13.0
Belgium	35.5	NA	NA	NA	NA	NA	NA	NA
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	442.1(b)	0.8	$ 7.9	0.0	28.5	109.9	107.9	187.1
India	159.9	11.0	10.4	4.5	17.6	61.4	18.6	36.4
Italy	808.1	65.8	26.6	8.9	79.9	156.0	98.3	372.6
Japan	3,143.1	123.6	60.9	48.5	368.5	768.9	302.5	1,407.2
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA
Norway	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	197.1	17.1	11.2	0.6	19.1	55.5	52.4	41.2
Sweden(E)	108.3	8.0	(a)	0.0	43.8	37.4	16.1	3.0
Switzerland	758.0	NA	NA	NA	NA	NA	NA	NA
United Kingdom	494.8	10.5	7.5	0.0	59.5	142.5	45.5	229.3(c)
United States	2,919.0	194.0	106.0	87.0	460.0	517.0	303.0	1,252.0
West Germany	2,429.0	128.2	63.5	121.2	448.0	593.47	328.4	746.3

NA - Not Available. E - Estimate.

(a) Included in "Boring Machines."
(b) French data for the components of the Metal Cutting Industry do not add to the total supplied by the French for the Metal Cutting Industry.
(c) "Other Metal Cutting" includes Metal Forming NC data.

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

PRODUCTION OF METAL FORMING MACHINE TOOLS
Selected Countries, 1982
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 48.0	$ 2.3	$ 7.0	$ 38.6
Belgium	65.6	NA	NA	NA
Denmark	NA	NA	NA	NA
France	126.9(b)	18.1	42.9	61.8
India	23.0	2.3	10.8	9.8
Italy	330.5	34.8	122.0	173.8
Japan	653.3	60.6	507.2	85.5
Netherlands	NA	NA	NA	NA
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	62.3	7.8	21.5	32.9
Sweden(E)	71.6	27.4	(a)	44.2
Switzerland	58.1	NA	NA	NA
United Kingdom	107.6(c)	NA	NA	NA
United States	826.0	138.0	339.0	349.0
West Germany	1,076.0	184.6	448.8	442.6

NA - Not Available. E - Estimate.

(a) Included in "Punching & Shearing."
(b) French data for the components of the Metal Forming Industry do not add to the total supplied by the French for the Metal Forming Industry.
(c) Metal Forming NC data is included in "Other Metal Cutting."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1982
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 113.8	$12.5	(a)	$ 0.7	$ 25.8	$ 20.4	$ 20.9	$ 33.5
Belgium	84.8	3.3	8.5	3.0	9.1	30.0	10.3	20.6
Denmark	45.0	NA	NA	NA	NA	NA	NA	NA
France	348.1	25.7	34.1	7.8	64.8	82.9	48.5	84.3
India	NA	NA	NA	NA	NA	NA	NA	NA
Italy	155.3	11.1	6.7	5.9	23.7	34.0	22.9	51.0
Japan	175.1	6.0	5.7	34.5	65.9	25.2	14.1	23.7
Netherlands	61.7	5.2	6.4	0.7	12.4	17.2	13.1	6.7
Norway	47.7	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	91.0	1.2	3.3	3.5	19.3	25.9	3.1	34.7
Sweden	114.9	5.3	(a)	1.1	18.3	30.2	26.1	33.9
Switzerland	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom	330.2	22.0	11.5	6.1	43.3	89.6	40.4	117.3
United States	1,026.0	59.0	21.0	26.0	118.0	358.0	88.0	356.0
West Germany	353.9	51.9	26.8	9.1	75.8	89.4	55.2	45.7

NA - Not Available.

(a) Included in "Boring Machines."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF METAL FORMING MACHINE TOOLS
Selected Countries, 1982
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 67.3	$ 5.6	$11.8	$ 49.9
Belgium	32.0	7.4	7.4	17.2
Denmark	NA	NA	NA	NA
France	131.2	32.7	32.6	65.9
India	NA	NA	NA	NA
Italy	53.3	6.7	19.2	27.4
Japan	45.3	3.4	11.9	30.0
Netherlands	31.9	9.4	7.5	15.0
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	85.1	(a)	51.9	33.2
Sweden	36.3	20.9	(b)	15.4
Switzerland	NA	NA	NA	NA
United Kingdom	78.7	19.5	25.0	34.2
United States	192.0	42.0	40.0	110.0
West Germany	134.7	17.3	25.1	92.3

NA - Not Available.

(a) Included in "Other Metal Forming."
(b) Included in "Punching & Shearing."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1982
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Machines
Austria	$ 74.0	$ 9.8	$ (a)	$ 0.0	$ 11.1	$ 32.5	$ 17.1	$ 3.5
Belgium	65.8	8.8	2.6	2.5	3.2	30.6	2.1	16.0
Denmark	41.8	NA	NA	NA	NA	NA	NA	NA
France	183.3	9.4	9.7	1.1	38.8	47.3	41.4	35.6
India	16.5	0.3	1.8	0.0	1.4	7.6	4.9	0.5
Italy	451.7	54.7	38.4	3.0	45.1	78.4	56.9	175.2
Japan	994.1	42.2	36.9	7.7	99.3	366.3	60.9	380.8
Netherlands	33.7	6.7	1.5	0.0	15.4	4.1	3.0	3.0
Norway	4.6	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	124.2	11.0	9.0	0.5	14.1	28.0	45.5	16.1
Sweden	71.5	7.5	(a)	0.3	29.6	20.5	10.3	3.3
Switzerland	682.2	NA	NA	NA	NA	NA	NA	NA
United Kingdom	359.5	26.9	21.1	10.9	75.9	103.8	61.6	59.3
United States	375.0	18.0	12.0	37.0	71.0	85.0	22.0	130.0
West Germany	1,435.8	97.7	45.7	68.4	342.5	363.9	204.0	313.6

NA - Not Available.

(a) Included in "Boring Machines."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF METAL FORMING MACHINE TOOLS
Selected Countries, 1982
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 47.0	$ 2.4	$ 1.9	$ 42.7
Belgium	50.2	10.5	28.3	11.4
Denmark	NA	NA	NA	NA
France	111.7	14.8	28.3	68.6
India	1.7	0.5	1.0	0.2
Italy	186.3	27.4	47.3	111.6
Japan	278.5	50.3	114.8	113.4
Netherlands	32.5	8.6	4.1	19.8
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	50.7	(a)	14.8	35.9
Sweden	66.8	40.4	(b)	26.4
Switzerland	32.0	NA	NA	NA
United Kingdom	118.2	15.9	41.3	61.0
United States	199.0	33.0	54.0	112.0
West Germany	770.6	110.4	228.3	431.9

NA - Not Available.

(a) Included in "Other Metal Forming."
(b) Included in "Punching & Shearing."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
World																		
1974	$3,886	100.0%	$449	12.6%	$1,567	40.3%	$ 307	7.9%	$398	10.3%	$319	8.2%	$250	6.4%	$236	6.1%	$ 93	2.4%
1975	4,620	100.0	580	12.5	1,748	37.8	309	6.7	440	9.5	431	9.3	362	7.8	320	6.9	113	2.5
1976	4,428	100.0	553	12.5	1,670	37.7	363	8.2	457	10.3	364	8.2	317	7.2	272	6.1	115	2.6
1977	4,855	100.0	458	9.4	1,772	36.5	611	12.6	498	10.2	437	9.0	323	6.7	269	5.5	123	2.5
1978	6,279	100.0	585	9.3	2,086	33.2	1,017	16.2	659	10.5	598	9.5	426	6.8	383	6.1	139	2.2
1979	7,440	100.0	685	9.2	2,441	32.8	1,229	16.5	792	10.6	690	9.3	474	6.4	459	6.2	176	2.4
1980	8,679	100.0	831	9.6	2,739	31.6	1,454	16.8	871	10.0	845	9.7	674	7.8	516	5.9	181	2.1
Industrial Countries																		
United States																		
1974	$ 308	100.0%	—	—	$ 85	27.6%	$ 52	16.7%	$ 36	11.6%	$ 20	6.4%	$ 30	9.9%	$ 14	4.4%	$ 10	3.2%
1975	322	100.0	—	—	95	29.4	54	16.8	29	9.1	17	5.3	39	12.2	15	4.6	11	3.3
1976	317	100.0	—	—	97	30.7	70	22.0	27	8.5	15	4.7	34	10.8	9	2.7	8	2.7
1977	422	100.0	—	—	106	25.0	111	26.4	35	8.3	17	4.1	47	11.0	10	2.5	18	4.2
1978	678	100.0	—	—	166	24.6	219	32.3	59	8.7	30	4.4	73	10.8	18	2.6	25	3.7
1979	974	100.0	—	—	191	19.6	365	37.5	71	7.3	41	4.2	96	9.9	26	2.6	32	3.3
1980	1,264	100.0	—	—	243	19.2	519	41.1	95	7.5	58	4.6	135	10.7	31	2.4	31	2.4
West Germany																		
1974	167	100.0	$ 17	10.2%	—	—	8	4.8	50	29.8	24	14.1	13	7.8	20	11.9	47	3.9
1975	191	100.0	14	7.4	—	—	9	4.9	54	28.5	30	16.0	18	9.5	26	13.4	7	3.9
1976	201	100.0	17	8.2	—	—	10	4.9	60	30.0	28	13.8	19	9.3	21	10.5	10	4.9
1977	290	100.0	25	8.5	—	—	23	7.9	80	27.5	53	18.3	23	7.8	27	9.4	16	5.5
1978	381	100.0	31	8.1	—	—	39	10.2	122	32.1	56	14.6	29	7.6	37	9.6	14	3.7
1979	537	100.0	32	5.9	—	—	83	15.4	174	32.5	71	13.2	32	5.9	48	9.0	18	3.3
1980	685	100.0	36	5.3	—	—	108	15.8	206	30.0	102	14.9	59	8.6	55	8.0	25	3.7

(Continued)

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country: United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
France																		
1974	$268	100.0%	$ 12	4.5%	$146	54.3%	$ 2	.6%	$34	12.7%	$33	12.3%	$15	5.7%	—	—	$ 3	1.3%
1975	355	100.0	16	4.5	196	55.3	1	.4	41	11.7	52	14.7	19	5.4	—	—	5	1.4
1976	320	100.0	19	5.9	162	50.7	2	.7	43	13.6	41	12.9	18	5.8	—	—	6	1.8
1977	256	100.0	11	4.3	135	52.8	2	.9	33	12.9	38	14.8	17	6.5	—	—	3	1.1
1978	267	100.0	13	5.0	117	43.8	5	1.9	48	17.9	46	17.3	16	5.9	—	—	6	2.2
1979	342	100.0	22	6.5	145	42.5	10	3.0	58	17.0	55	16.0	22	6.4	—	—	6	1.6
1980	494	100.0	23	4.7	196	39.8	31	6.2	63	12.8	95	19.2	38	7.7	—	—	7	1.5
United Kingdom																		
1974	194	100.0	28	14.4	67	44.9	6	3.3	22	13.0	15	7.8	—	—	$10	5.0%	10	5.1
1975	220	100.0	35	16.1	90	40.9	9	4.2	25	11.2	16	7.1	—	—	17	7.8	10	4.5
1976	219	100.0	38	17.5	90	41.2	9	4.1	23	10.7	12	5.3	—	—	11	5.2	14	6.2
1977	223	100.0	27	12.2	90	40.2	12	5.5	27	11.9	19	8.5	—	—	13	6.0	10	4.3
1978	356	100.0	50	14.2	149	41.7	24	6.8	36	10.1	28	7.7	—	—	19	5.3	15	4.1
1979	521	100.0	87	16.7	214	41.1	46	8.9	51	9.7	44	8.5	—	—	33	6.3	20	3.8
1980	499	100.0	67	13.4	188	37.6	69	13.8	47	9.5	50	10.1	—	—	22	4.4	19	3.9
Canada																		
1974	105	100.0	67	64.3	10	9.3	4	4.1	2	1.6	4	3.6	12	11.7	3	2.8	2	1.5
1975	126	100.0	79	62.4	14	11.5	6	4.4	2	2.0	5	3.9	13	10.1	4	2.9	2	1.7
1976	114	100.0	81	71.2	8	7.3	6	5.0	1	.5	4	3.7	9	7.8	2	1.5	2	1.7
1977	109	100.0	63	57.7	13	12.4	7	6.8	2	1.5	6	5.5	10	9.6	2	2.2	2	2.3
1978	136	100.0	82	60.1	15	11.2	9	6.9	2	1.5	10	7.0	10	7.2	4	3.1	3	1.9
1979	180	100.0	105	58.1	19	10.7	14	7.6	2	1.3	13	7.1	16	8.8	4	2.2	5	2.9
1980	283	100.0	170	59.9	30	10.6	30	10.5	4	1.6	13	4.8	25	8.8	4	1.5	4	1.4
Switzerland																		
1974	87	100.0	4	4.8	55	63.2	1	.6	—	—	9	10.0	6	6.9	7	7.9	2	2.2
1975	72	100.0	4	5.8	40	55.5	(c)	.2	—	—	9	12.6	7	9.0	7	9.9	2	2.6
1976	63	100.0	3	4.6	37	58.2	(c)	.4	—	—	8	12.9	8	12.3	3	5.2	1	1.6
1977	82	100.0	3	4.2	50	61.4	1	1.1	—	—	10	11.8	7	8.1	6	6.8	2	2.2
1978	134	100.0	5	3.5	80	59.6	2	1.5	—	—	17	12.9	11	8.1	12	8.6	3	2.0
1979	157	100.0	7	4.5	92	58.5	4	2.7	—	—	19	12.1	8	5.2	12	7.9	3	1.9
1980	229	100.0	14	6.0	122	53.4	12	5.2	—	—	28	12.1	25	10.8	17	7.3	3	1.4

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country: United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Japan																		
1974	$147	100.0%	$50	34.1%	$64	43.6%	—	—	$16	11.2%	$ 3	2.0%	$ 6	3.9%	$ 2	1.3%	$2	1.2%
1975	100	100.0	42	42.4	38	37.6	—	—	8	7.6	1	1.0	3	2.9	2	1.7	1	1.2
1976	60	100.0	27	45.7	15	25.7	—	—	11	17.8	1	1.4	2	3.9	2	2.5	(c)	.7
1977	75	100.0	23	30.4	35	47.4	—	—	8	10.3	1	1.8	1	1.6	2	3.1	1	1.9
1978	102	100.0	40	39.1	37	36.2	—	—	15	14.6	1	0.7	2	2.1	1	1.0	2	1.7
1979	153	100.0	51	33.0	65	42.5	—	—	20	12.9	2	1.0	3	2.2	2	1.3	3	1.8
1980	183	100.0	61	33.4	67	36.6	—	—	36	19.5	5	2.9	4	2.4	3	1.4	2	1.2
Developing Countries																		
Brazil																		
1974	203	100.0	38	18.9	98	48.6	$ 14	6.9%	11	5.7	18	9.0	11	5.6	3	1.2	2	1.1
1975	273	100.0	56	20.4	94	27.3	26	6.5	11	2.3	55	7.3	16	5.6	6	2.2	3	.6
1976	236	100.0	88	37.2	74	31.5	18	7.6	8	3.5	20	8.5	15	6.5	6	2.5	2	.7
1977	172	100.0	41	23.7	63	36.8	21	12.1	6	3.8	21	12.0	12	7.0	3	1.7	1	.7
1978	211	100.0	32	15.0	76	36.0	40	18.8	17	7.9	31	14.7	10	4.8	5	2.3	2	1.0
1979	187	100.0	24	13.0	95	50.6	22	11.9	8	4.4	15	7.8	7	3.8	2	1.2	8	4.3
1980	201	100.0	19	9.7	122	60.6	22	10.8	9	4.7	16	7.8	5	2.4	3	1.6	2	1.0
Republic of Korea																		
1974	55	100.0	4	6.5	9	16.1	41	73.9	1	1.2	(c)	(d)	(c)	.7	(c)	.1	(c)	(d)
1975	81	100.0	5	6.3	11	14.1	40	49.3	2	1.9	(c)	.1	9	11.4	12	14.9	(c)	.2
1976	98	100.0	5	5.6	7	7.6	65	67.0	1	1.5	(c)	.2	16	16.0	(c)	.2	(c)	.2
1977	164	100.0	7	4.2	18	10.9	133	81.1	2	1.4	(c)	.1	2	1.3	1	.6	(c)	.2
1978	323	100.0	24	7.5	39	12.1	231	71.6	9	2.9	NA	NA	8	2.4	7	2.3	NA	NA
1979	376	100.0	34	9.1	85	22.6	212	56.4	8	2.2	4	1.1	14	3.7	13	3.4	1	0.4
1980	156	100.0	24	15.3	24	15.3	95	60.7	4	2.7	1	0.8	3	1.7	3	1.7	(c)	0.1
Spain																		
1974	128	100.0	6	4.8	60	46.7	2	1.4	13	10.0	13	10.3	7	5.7	18	14.4	2	1.9
1975	174	100.0	28	16.2	71	40.5	1	.5	11	6.0	18	10.5	19	10.7	12	7.0	3	1.8
1976	102	100.0	6	5.7	46	45.0	2	2.1	5	4.8	13	12.9	11	10.6	9	8.8	3	2.6
1977	91	100.0	4	4.7	38	41.4	6	6.4	8	8.6	14	14.9	5	5.4	10	11.0	1	1.1
1978	89	100.0	4	4.3	37	42.0	3	3.9	6	7.1	16	17.9	4	4.7	15	16.6	1	0.9
1979	95	100.0	5	5.0	42	44.0	2	1.9	5	5.1	22	22.9	5	5.6	12	12.1	1	0.6
1980	102	100.0	14	13.2	31	30.3	3	3.1	6	5.6	17	16.9	10	10.0	16	15.9	1	1.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Venezuela																		
1974	$ 23	100.0%	$ 6	25.4%	$ 6	25.3%	(c)	.5%	(c)	1.4%	$ 7	31.9%	$ 1	2.3%	$ 1	4.0%	(c)	1.9%
1975	45	100.0	12	27.4	8	16.8	(c)	.7	(c)	1.1	17	37.6	2	4.2	3	5.6	$1	1.1
1976	55	100.0	19	35.1	11	19.9	$ 1	1.9	$ 1	1.4	16	28.7	2	4.4	1	2.0	1	1.4
1977	75	100.0	20	27.1	16	21.6	1	1.4	3	4.5	23	31.0	3	4.3	1	1.8	1	1.1
1978	85	100.0	27	31.8	16	18.5	5	5.5	2	2.2	21	24.9	3	3.3	4	4.4	1	1.1
1979	88	100.0	46	52.8	8	9.0	4	4.6	2	1.9	21	23.4	3	3.5	(c)	0.5	(c)	0.5
1980	61	100.0	21	34.5	13	21.7	2	2.9	2	3.0	18	29.6	2	3.3	1	2.0	(c)	0.7
Mexico																		
1974	71	100.0	35	49.5	19	27.1	2	2.3	2	2.3	5	6.4	2	3.2	4	5.1	1	1.0
1975	77	100.0	41	52.7	16	21.0	2	2.4	2	3.1	6	7.2	4	5.6	3	3.8	1	1.1
1976	90	100.0	53	59.3	17	18.4	1	1.1	3	3.0	5	6.1	4	4.8	3	3.6	1	.9
1977	70	100.0	42	60.1	8	10.9	9	12.1	2	2.8	4	6.2	2	3.4	(c)	.5	1	.9
1978	75	100.0	38	50.5	15	20.5	7	9.2	2	3.3	4	5.1	4	4.8	1	0.9	1	1.9
1979	121	100.0	70	58.2	20	16.7	7	5.7	3	2.9	8	6.8	4	3.2	2	1.2	2	1.8
1980	324	100.0	143	44.2	97	30.0	17	5.3	9	2.7	15	4.6	20	6.3	5	1.6	4	1.2
Turkey																		
1974	29	100.0	1	3.4	16	56.1	(c)	.7	2	8.5	5	18.7	1	4.2	1	3.0	(c)	.6
1975	54	100.0	3	5.0	29	54.0	(c)	.9	3	6.2	8	13.9	5	8.4	2	4.2	1	1.0
1976	64	100.0	1	1.6	26	40.1	2	2.4	3	5.0	9	14.2	10	15.5	3	4.7	1	1.0
1977	62	100.0	1	1.0	19	31.0	1	.9	3	5.5	9	14.4	12	19.3	15	23.6	1	1.6
1978	46	100.0	5	10.7	15	33.6	2	5.1	1	1.9	11	23.8	3	6.6	7	15.5	1	1.5
1979	40	100.0	2	3.8	13	31.4	NA	NA	5	12.8	6	15.1	4	9.5	8	19.3	NA	NA
1980	48	100.0	(c)	0.9	16	34.1	1	3.1	3	6.4	5	11.0	3	6.3	15	30.7	NA	NA
India																		
1974	37	100.0	2	5.2	17	45.4	3	7.1	6	17.3	(c)	1.1	4	10.0	3	8.4	(c)	.6
1975	53	100.0	3	5.6	24	46.2	3	4.8	7	13.1	2	3.4	6	11.1	2	3.9	1	1.3
1976	52	100.0	2	4.7	28	52.7	1	2.5	8	14.7	1	1.5	6	10.9	1	1.4	2	3.3
1977	48	100.0	4	8.8	24	49.7	1	2.1	8	15.8	(c)	.8	5	9.8	2	3.7	1	2.7
1978	70	100.0	7	9.9	32	45.6	4	5.2	14	20.6	2	3.0	6	8.0	3	4.0	NA	NA
1979	74	100.0	5	6.1	26	34.5	8	10.8	15	20.8	3	4.4	9	12.1	5	6.8	2	2.2
1980	100	100.0	10	10.2	38	37.5	12	12.3	14	14.0	5	4.8	16	15.9	2	2.1	1	0.9

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Saudi Arabia																		
1974	$ 3	100.0%	(c)	9.5%	$ 1	43.5%	(c)	2.0%	(c)	3.0%	(c)	14.4%	$ 1	17.5%	(c)	5.6%	(c)	.3%
1975	12	100.0	$ 2	16.5	4	38.0	(c)	1.1	(c)	3.8	$ 1	9.9	2	16.2	$ 1	6.6	(c)	3.4
1976	31	100.0	4	11.7	7	23.8	(c)	1.2	$ 1	4.2	5	16.7	5	14.6	6	19.8	$ 2	5.0
1977	45	100.0	8	16.9	15	34.1	$ 1	1.8	2	5.1	7	14.9	2	4.1	9	19.9	1	1.2
1978	33	100.0	9	27.1	8	25.2	3	9.2	2	5.2	6	18.3	2	6.8	1	4.5	(c)	1.3
1979	47	100.0	15	32.7	11	22.5	8	16.3	1	1.8	7	14.2	2	3.9	3	5.6	1	1.2
1980	40	100.0	11	27.4	7	18.7	3	8.6	1	2.7	8	20.0	4	8.9	3	8.0	1	1.8
China																		
1974	50	100.0	—	—	12	24.8	18	36.9	12	24.4	4	7.8	1	1.8	2	3.3	(c)	.4
1975	74	100.0	5	6.4	24	32.1	21	28.5	14	18.7	4	5.9	3	3.5	(c)	.4	1	1.5
1976	61	100.0	2	3.5	15	24.5	22	36.9	15	24.6	3	5.5	2	3.4	1	1.1	(c)	(d)
1977	39	100.0	4	8.9	14	35.6	3	8.4	15	38.4	(c)	.6	(c)	.2	3	6.6	(c)	(d)
1978	68	100.0	6	8.8	20	29.5	15	22.3	12	18.2	2	2.8	1	1.7	NA	NA	NA	NA
1979	112	100.0	NA	NA	34	30.7	30	27.0	24	21.1	3	2.4	4	4.0	NA	NA	NA	NA
1980	132	100.0	7	5.1	40	30.7	27	20.8	14	10.7	10	8.0	5	3.7	NA	NA	NA	NA
Argentina																		
1974	26	100.0	3	13.3	12	45.4	3	.6	3	10.2	3	11.5	2	6.5	2	9.0	(c)	.5
1975	28	100.0	4	15.0	7	23.9	(c)	10.2	1	4.8	7	26.1	2	7.9	1	4.3	1	3.8
1976	25	100.0	4	16.9	10	38.0	3	1.0	2	8.8	6	23.0	1	3.2	1	5.0	(c)	1.3
1977	30	100.0	3	10.8	9	31.1	1	1.7	5	15.3	7	21.7	2	5.2	3	9.0	(c)	1.5
1978	78	100.0	11	14.3	33	42.0	1	1.0	6	8.2	16	20.6	NA	NA	4	5.8	1	1.2
1979	64	100.0	9	13.4	24	37.6	NA	3.0	9	13.6	10	14.9	3	4.1	7	10.4	1	1.7
1980	80	100.0	14	17.7	18	21.8	2	3.0	7	8.4	23	28.0	5	5.9	10	12.7	1	1.2
Eastern Europe																		
U.S.S.R.																		
1974	449	100.0	68	15.2	185	41.2	39	8.6	46	10.2	40	8.9	9	1.9	32	7.1	9	2.1
1975	553	100.0	92	16.6	224	40.5	29	5.2	66	11.9	44	7.9	13	2.3	53	9.5	13	2.4
1976	577	100.0	48	8.3	307	53.2	24	4.1	80	13.8	39	6.7	13	2.3	25	4.3	15	2.5
1977	649	100.0	31	4.8	320	49.2	80	12.4	80	12.4	43	6.6	9	1.3	21	3.2	15	2.3
1978	637	100.0	17	2.6	301	47.3	78	12.3	71	11.1	77	12.0	NA	NA	42	6.7	5	0.8
1979	635	100.0	7	1.1	315	49.6	47	7.3	73	11.5	78	12.3	18	2.8	58	9.1	11	1.7
1980	749	100.0	26	3.4	391	52.2	67	8.9	82	10.9	68	9.1	19	2.6	67	9.0	7	1.0

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Poland																		
1974	$154	100.0%	$ 3	2.1%	$61	39.7%	$ 4	2.4%	$20	13.1%	$25	16.4%	$ 8	5.2%	$11	7.2%	$8	4.9%
1975	167	100.0	8	4.7	42	25.2	2	1.0	27	16.3	21	12.5	24	14.2	19	11.7	6	3.5
1976	205	100.0	13	6.6	56	27.3	17	8.5	26	12.8	15	7.2	15	7.5	35	17.3	8	3.8
1977	203	100.0	8	4.0	54	26.8	41	20.1	25	12.4	21	10.1	21	10.4	12	5.7	6	3.1
1978	264	100.0	25	9.4	81	30.8	26	9.9	27	10.4	22	8.4	52	19.7	10	3.6	7	2.6
1979	187	100.0	3	1.8	56	30.1	NA	NA	17	9.2	16	8.5	34	17.9	8	4.4	3	1.9
1980	114	100.0	2	1.8	38	33.6	6	5.0	17	15.2	15	13.0	14	12.0	16	14.3	3	2.4
Rumania																		
1974	51	100.0	(c)	.8	28	53.9	2	3.1	8	14.7	6	11.9	2	4.1	3	5.1	2	4.7
1975	73	100.0	2	3.2	34	46.1	2	2.5	14	19.4	7	9.3	6	7.6	3	4.0	4	6.1
1976	74	100.0	2	2.2	34	46.2	3	4.2	6	8.4	14	18.8	2	2.2	6	8.1	3	7.4
1977	140	100.0	5	3.4	57	40.7	26	18.8	14	10.1	13	9.1	4	3.1	10	6.9	2	1.2
1978	267	100.0	21	8.0	73	27.1	50	18.8	17	6.3	37	13.7	7	2.5	56	20.9	2	0.6
1979	243	100.0	7	2.7	58	24.1	23	9.4	17	7.1	52	21.5	6	2.3	72	29.7	2	1.0
1980	126	100.0	3	2.7	24	19.2	4	2.8	7	5.8	36	28.6	5	3.6	34	27.3	(c)	0.1
Yugoslavia																		
1974	47	100.0	1	2.0	28	60.0	(c)	13.6	6	13.7	6	1.4	1	5.3	2	.7	(c)	1.2
1975	85	100.0	2	1.8	53	61.9	(c)	(d)	9	10.5	9	11.1	1	1.3	8	9.8	1	.6
1976	68	100.0	2	3.2	39	57.6	NA	NA	11	16.4	6	8.1	2	2.9	5	7.1	2	2.6
1977	87	100.0	2	1.8	57	65.7	NA	NA	11	13.0	8	9.6	3	3.5	3	3.4	1	1.5
1978	143	100.0	5	3.6	83	58.4	NA	NA	22	15.5	15	10.3	5	3.3	6	4.5	3	2.4
1979	186	100.0	5	2.7	98	52.5	8	4.2	22	11.9	24	12.9	2	1.2	14	7.5	(c)	0.5
1980	139	100.0	3	2.2	66	47.6	NA	NA	17	12.1	31	22.4	4	2.8	14	10.1	2	1.3
Czechoslovakia																		
1974	33	100.0	(c)	.2	20	59.6	(c)	.1	8	24.2	1	3.0	1	2.2	1	3.7	1	1.7
1975	51	100.0	(c)	(d)	30	59.2	(c)	.6	7	13.9	2	4.2	1	1.6	[illegible]	4.6	1	1.9
1976	57	100.0	(c)	.8	26	44.9	(c)	.2	11	18.8	2	4.2	4	6.4	8	14.5	1	1.1
1977	53	100.0	(c)	.9	34	63.5	2	3.0	8	15.2	3	5.4	1	2.7	1	1.3	(c)	.3
1978	75	100.0	(c)	0.3	49	64.3	NA	NA	12	15.8	6	[illegible]	2	2.0	2	3.1	1	0.8
1979	82	100.0	NA	NA	54	65.8	1	0.6	17	20.8	3	4.0	1	1.2	1	1.7	3	3.2
1980	78	100.0	NA	NA	44	56.1	NA	NA	11	13.7	11	14.6	3	3.4	4	5.6	(c)	0.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Hungary																		
1974	$12	100.0%	(c)	.2%	$ 7	53.5%	$1	5.6%	$2	20.3%	(c)	2.3%	(c)	3.2%	$1	4.5%	(c)	.8%
1975	15	100.0	(c)	.4	9	57.8	(c)	(d)	3	22.4	$1	9.4	(c)	2.7	1	4.4	(c)	1.6
1976	27	100.0	(c)	.6	13	48.4	(c)	.1	5	19.2	5	18.5	(c)	1.4	1	2.9	$1	4.4
1977	50	100.0	$2	3.4	32	63.6	3	7.0	5	10.4	1	2.0	$1	1.7	1	1.9	1	1.6
1978	48	100.0	(c)	0.4	26	55.3	1	1.9	7	15.3	4	9.2	1	1.4	2	5.0	NA	NA
1979	62	100.0	1	1.8	44	70.9	NA	NA	6	9.1	3	4.3	NA	NA	2	3.1	1	1.5
1980	41	100.0	NA	NA	22	53.3	NA	NA	7	16.2	3	8.3	1	3.4	2	4.5	(c)	0.9

NA - Not Available.

(a) Re-exported items are included; therefore these figures are inconsistent with other Handbook data.

(b) Percent of Total is proportion of Total Exports from 14 Major Producers. The 14 countries are: United States, Austria, Belgium, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland and the United Kingdom.

(c) Less than $500,000.

(d) Less than .05%.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools for Working Metals.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

Code 84.45	Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
	METAL CUTTING						
01	For fissionable material, NC	$ 296	$ —	$ —	$ 140	$ 141	$ —
03	For fissionable material, not NC	189	—	7	142	38	—
05	Electro erosion, electric, ultrasonic, NC	47,764	22,692	8,989	8,564	2,486	4,039
07	Electro erosion, electric, ultrasonic, not NC	27,113	6,472	7,246	9,293	1,045	2,127
12	Center and copying multiple tool lathes, NC	80,037	22,044	14,909	4,381	17,560	18,059
14	Automatic and turret lathes, NC	78,433	13,951	19,959	4,357	7,441	28,585
16	Automatic and revolving lathes, not parallel, multiple tool, NC	59,267	10,425	13,635	6,494	6,071	19,580
22	Center and copying lathes, multiple tool, not NC	46,716	18,305	8,360	3,255	5,411	8,988
24	Automatic and turret lathes, not NC	64,007	14,904	20,900	9,878	3,063	14,011
26	Automatic and turret lathes, not parallel, multiple tool, not NC	33,295	9,931	5,189	5,915	7,674	—
36	Boring-milling machines, horizontal, NC	61,214	25,966	11,974	4,226	4,284	12,317
37	Boring machines, not boring-milling, NC	10,979	2,811	3,828	493	716	3,085
38	Boring-milling, horizontal, not NC	17,503	5,083	3,294	1,288	1,977	4,435
39	Boring machines, not boring-milling, not NC	15,596	3,257	6,722	1,834	1,424	2,094
41	Planing machines, NC	304	61	139	8	39	—
43	Planing machines, not NC	1,328	302	421	91	151	143
44	Shaping & slotting, broaching, sawing, NC	3,356	730	1,833	336	2	58
45	Shaping & Slotting, not NC	3,983	224	582	352	407	1,384
46	Broaching machines, not NC	10,225	983	4,412	12	76	4,708
47	Sawing and cut-off machines, not NC	49,981	8,382	12,157	7,219	6,779	10,842
48	Milling machines, NC	88,067	21,652	23,631	7,823	12,035	19,487
49	Radial drilling machines, NC	1,758	356	209	306	158	451
51	Piercing machines, not drilling, NC	42,926	9,702	17,752	3,608	6,547	3,952
52	Milling machines, not NC	110,805	33,609	24,909	15,014	11,768	20,829
53	Radial drilling machines, not NC	8,760	3,118	1,544	1,392	1,360	1,068
54	Other drilling machines	46,563	13,519	14,639	1,821	7,000	5,969
55	Cylindrical and surface grinding machines (micrometric) NC	31,589	4,756	7,497	10,424	1,980	5,811
56	Grinding, honing, polishing, lapping (micrometric), NC	6,507	3,401	654	227	1,137	633
57	Surface grinding machines, plane surface (micrometric), not NC	24,137	3,749	6,046	1,520	2,984	8,217
58	Surface grinding machines, cylindrical surface (micrometric), not NC	45,336	16,811	11,887	1,948	2,576	10,988
59	Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	52,710	16,149	11,078	9,874	3,189	9,669
61	Grinding, honing, polishing, lapping, (micrometric), not NC	35,225	15,551	7,389	4,077	1,890	5,258
62	Grinding, honing, polishing, lapping (not micrometric), NC	5,287	1,594	2,695	332	251	75
63	Grinding, honing, polishing, lapping (not micrometric), not NC	50,207	13,544	17,684	6,425	7,150	2,722
64	Jig boring & milling machines, NC	37,767	11,867	5,589	2,414	14,725	1,727
65	Jig boring & milling machines, not NC	6,738	2,889	770	1,075	440	1,348
66	Gear cutting machines, cylindrical, NC	1,921	295	693	154	4	753
68	Gear cutting machines, cylindrical, not NC	11,994	1,149	4,563	2,178	2,080	1,938
69	Gear cutting machines, noncylindrical, NC	3,906	183	153	351	953	2,287
71	Gear cutting machines, noncylindrical, not NC	14,762	7,278	2,392	2,921	768	1,141
93	Screwing and tapping machines by cutting	16,481	2,951	3,433	3,678	1,982	3,790
94	Other metal cutting machinas	132,877	3,338	38,795	978	1,154	87,110
	Total imports, cutting (EEC)	$1,387,909	$353,964	$348,558	$146,824	$148,916	$329,678

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

(Continued)

Code 84.45	Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
	METAL FORMING						
72	Hydraulic presses, NC, other than 8445.81, 82, 88	$ 9,314	$ 1,763	$ 1,108	$ 367	$ 3,154	$ 2,052
75	Presses, NC, other than 8445.81, 82, 88	9,988	516	897	2,020	537	4,422
77	Hydraulic presses, not NC, other than 8445.83, 87, 89	32,907	8,741	6,737	2,481	3,340	9,188
78	Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	13,841	4,435	3,065	1,253	957	3,301
79	Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	54,249	7,795	20,860	12,789	6,285	4,337
81	Rolling, bending, folding and planing machines, NC	20,498	5,480	4,555	1,223	3,241	2,818
82	Shearing, punching and stamping, NC	47,371	2,958	19,789	2,713	6,954	11,553
83	Rolling, bending, folding and planing machines, not NC	37,501	15,981	4,551	3,698	5,223	5,757
84	Rolling, bending, folding and planing, not flat products, not NC	32,925	8,257	8,164	2,613	5,127	6,129
85	Hydraulic shearing machines, not NC	21,028	8,429	5,141	848	2,442	3,259
86	Nonhydraulic shearing machines, not NC	15,033	2,881	4,013	2,364	2,952	2,059
87	Punching and stamping machines, not NC	17,458	4,535	3,757	893	4,331	2,587
88	Forging and stamping, NC	170	—	—	37	54	—
89	Forging and stamping, not NG	14,753	1,266	7,652	2,454	1,581	1,636
92	Forming by drawing, bare, tubes, wire etc.	9,259	1,424	757	2,125	1,984	2,809
95	Screwing and tapping machines not by cutting	4,928	2,142	1,004	582	164	898
96	Other metal forming machines for working flat products	8,048	1,391	2,135	500	999	2,349
97	Other machines for working wire	25,024	7,221	7,116	1,305	2,616	4,939
	Total imports, forming (EEC)	$ 374,295	$ 85,215	$101,301	$ 40,265	$ 51,941	$ 70,093
98	MACHINE TOOLS NEC	94,312	15,625	30,013	21,700	11,822	8,426
	Grand Total	$1,856,516	$454,804	$479,872	$208,789	$212,679	$408,197

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Comunities.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL CUTTING						
01 For fissionable material, NC	$ 9	$ —	$ 6	$ —	$ 3	$ —
03 For fissionable material, not NC	64	52	—	1	11	—
05 Electro erosion, electric, ultrasonic, NC	18,800	7,855	2,826	445	641	6,941
07 Electro erosion, electric, ultrasonic, not NC	20,742	13,362	469	522	275	5,996
12 Center and copying multiple tool lathes, NC	94,916	64,739	2,052	5,401	14,649	7,904
14 Automatic and turret lathes, NC	140,734	101,062	12,826	3,580	10,109	13,098
16 Automatic and revolving lathes, not parallel, multiple tool, NC	85,931	44,058	4,703	24,211	1,482	11,282
22 Center and copying lathes, multiple tool, not NC	97,608	38,369	10,051	9,316	4,648	35,134
24 Automatic and turret lathes, not NC	143,702	82,905	6,267	17,494	551	36,278
26 Automatic and turret lathes, not parallel, multiple tool, not NC	67,587	32,912	11,479	18,882	3,471	—
36 Boring-milling machines, horizontal, NC	94,223	47,315	2,834	20,116	7,761	13,998
37 Boring machines, not boring-milling, NC	15,933	4,806	—	1,271	6,487	3,319
38 Boring-milling, horizontal, not NC	23,927	8,800	3,211	4,436	513	5,730
39 Boring machines, not boring-milling, not NC	41,636	19,069	3,330	12,886	925	3,780
41 Planing machines, NC	1,227	957	9	245	16	—
43 Planing machines, not NC	4,660	2,785	624	876	148	225
44 Shaping & slotting, broaching, sawing, NC	3,867	1,060	1,445	960	—	402
45 Shaping & Slotting, not NC	7,449	3,376	302	1,683	72	1,972
46 Broaching machines, not NC	27,074	15,538	275	3,432	40	7,725
47 Sawing and cut-off machines, not NC	102,984	60,657	10,850	21,245	3,264	6,204
48 Milling machines, NC	147,748	91,998	18,423	23,849	1,949	11,241
49 Radial drilling machines, NC	5,673	1,289	82	3,936	30	53
51 Piercing machines, not drilling, NC	39,681	14,771	2,449	17,141	1,124	4,094
52 Milling machines, not NC	223,166	111,917	23,043	33,564	3,060	50,274
53 Radial drilling machines, not NC	8,961	2,106	492	4,222	332	1,716
54 Other drilling machines	67,189	27,635	6,794	13,163	2,879	15,215
55 Cylindrical and surface grinding machines (micrometric) NC	57,043	30,471	1,907	9,897	243	14,385
56 Grinding, honing, polishing, lapping (micrometric), NC	23,077	17,234	—	2,567	988	2,216
57 Surface grinding machines, plane surface (micrometric), not NC	83,365	56,036	2,430	7,213	481	12,950
58 Surface grinding machines, cylindrical surface (micrometric), not NC	107,073	66,471	2,729	2,323	487	27,788
59 Other grinding machines, not plane or cyclindrical surface, (micrometric), not NC	89,944	38,436	6,588	26,037	8,854	9,787
61 Grinding, honing, polishing, lapping, (micrometric), not NC	121,729	90,659	12,383	10,560	616	7,270
62 Grinding, honing, polishing, lapping (not micrometric), NC	4,387	1,569	2,534	121	151	—
63 Grinding, honing, polishing, lapping (not micrometric), not NC	83,486	41,888	10,225	19,443	6,562	1,423
64 Jig boring & milling machines, NC	42,068	14,892	66	14,467	12,625	—
65 Jig boring & milling machines, not NC	8,193	2,757	177	1,532	162	3,557
66 Gearcutting machines, cylindrical, NC	6,773	6,405	—	12	33	259
68 Gear cutting machines, cylindrical, not NC	42,208	34,047	109	403	16	7,552
69 Gear cutting machines, noncylindrical, NC	1,977	1,281	—	267	—	428
71 Gear cutting machines, noncylindrical, not NC	35,207	26,684	993	2,345	2,505	2,659
93 Screwing and tapping machines by cutting	26,141	10,780	2,021	2,798	2,196	3,760
94 Other metal cutting machines	281,792	197,356	16,590	45,345	203	22,167
Total exports, cutting (EEC)	$2,499,954	$1,436,359	$183,594	$388,207	$100,562	$358,782

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 10,700	$ 3,795	$ 6	$ 2,502	$ 565	$ 3,610
75 Presses, NC, other than 8445.81, 82, 88	13,829	5,210	—	3,776	2,650	2,084
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	108,250	70,154	3,892	5,963	12,582	11,878
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	38,950	28,142	965	2,093	5,228	2,523
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	189,770	114,094	23,520	33,203	10,219	8,299
81 Rolling, bending, folding and planing machines, NC	23,961	7,122	2,686	3,336	2,632	6,924
82 Shearing, punching and stamping, NC	70,123	53,765	2,348	6,078	2,096	4,776
83 Rolling, bending, folding and planing machines, not NC	83,211	48,643	4,756	12,785	7,568	5,958
84 Rolling, bending, folding and planing, not flat products, not NC	90,157	32,504	14,220	19,387	10,135	12,045
85 Hydraulic shearing machines, not NC	44,938	18,623	6,658	1,379	10,651	3,640
86 Nonhydraulic shearing machines, not NC	62,513	35,227	3,064	16,720	1,085	5,314
87 Punching and stamping machines, not NC	23,923	9,584	2,741	3,184	5,256	2,213
88 Forging and stamping, NC	8,619	8,313	—	82	223	—
89 Forging and stamping, not NG	52,427	35,339	3,675	3,758	1,094	8,414
92 Forming by drawing, bare, tubes, wire etc.	70,169	53,271	1,674	7,319	438	7,433
95 Screwing and tapping machines not by cutting	9,755	6,827	799	1,158	300	619
96 Other metal forming machines for working flat products	36,462	30,813	1,267	2,746	280	1,293
97 Other machines for working wire	75,021	57,157	7,160	3,010	3,813	3,444
Total exports, forming (EEC)	$1,012,773	$ 618,583	$ 79,411	$128,479	$ 76,815	$ 90,467
98 MACHINE TOOLS NEC	237,131	49,459	32,400	124,891	5,996	23,180
Grand Total	$3,749,858	$2,104,401	$295,405	$641,577	$183,373	$472,429

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

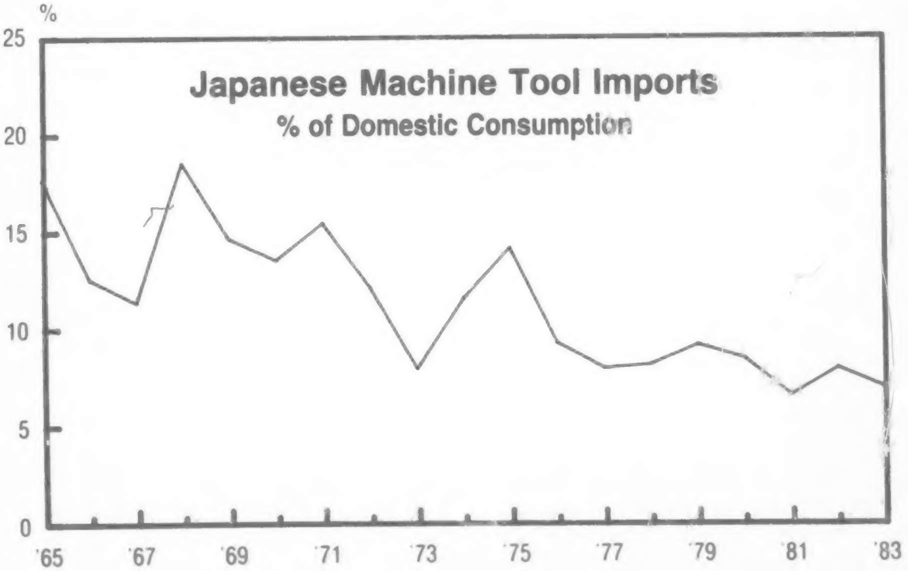
MACHINE TOOL IMPORTS AS A PERCENT OF DOMESTIC MACHINE TOOL CONSUMPTION, 1965 TO DATE

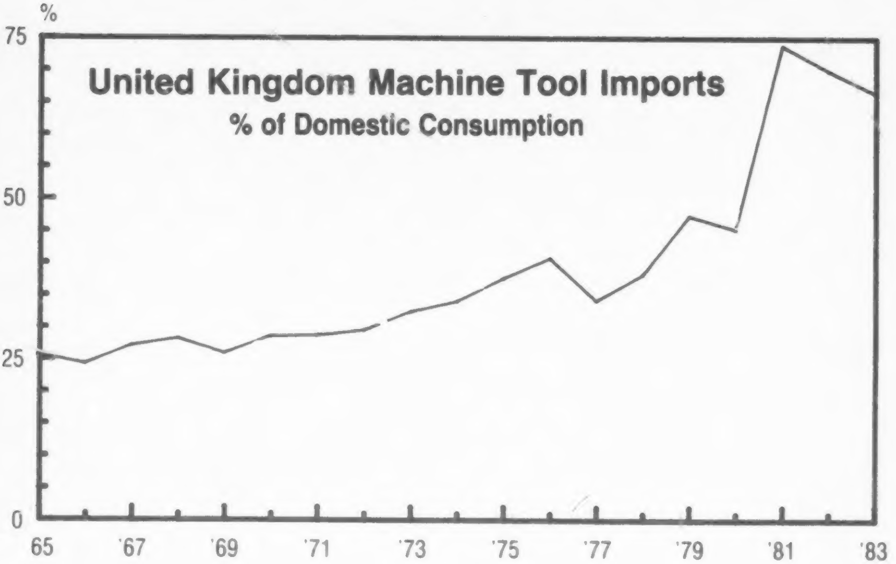
(Percent)

Year	U.S.A.(r)	Japan	United Kingdom	West Germany
1965	4.5%	17.7%	25.7%	17.8%
1966	7.4	12.6	24.3	18.0
1967	10.0	11.4	27.2	16.3
1968	9.8	18.6	28.3	21.4
1969	9.7	14.7	26.0	22.9
1970	9.5	13.6	28.7	23.8
1971	10.1	15.5	28.8	20.6
1972	10.0	12.2	29.6	22.1
1973	10.3	8.0	32.5	21.3
1974	13.4	11.6	34.1	23.7
1975	14.5	14.2	37.7	27.8
1976	16.1	9.3	40.8	27.7
1977	16.5	8.0	34.2	30.0
1978	21.5	8.2	38.3	29.9
1979	23.3	9.2	47.4	29.8
1980	23.6	8.5	45.3	32.8
1981	25.6	6.6	73.9	28.4
1982	27.7	8.0	70.0	25.4
1983	34.2	7.0	66.6	24.7

r - Revised.

Source: National Machine Tool Builders' Association and respective machine tool trade associations.




%
75
50
25
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United Kingdom Machine Tool Imports
% of Domestic Consumption
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'69
'71
'73
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'77
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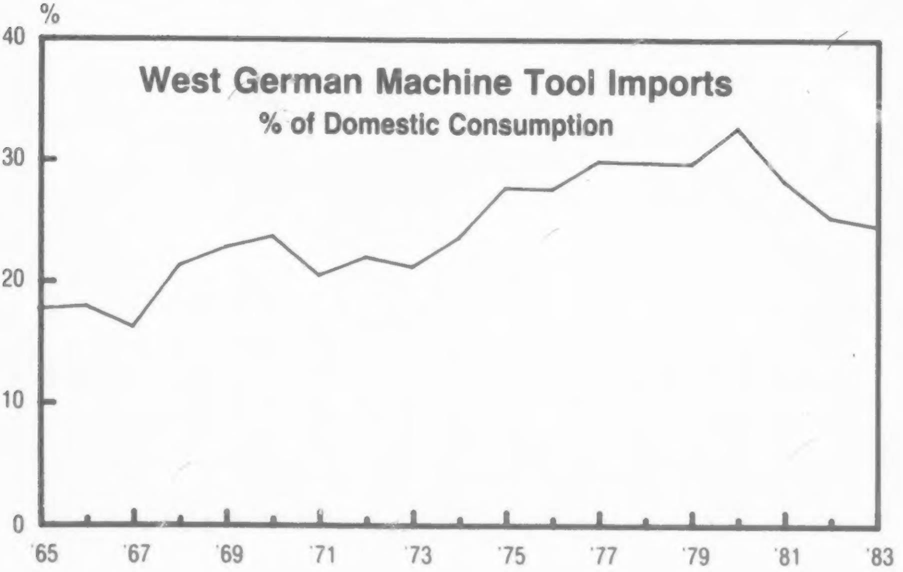
'83


%
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30
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10
0
West German Machine Tool Imports
% of Domestic Consumption
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'79
'81
'83

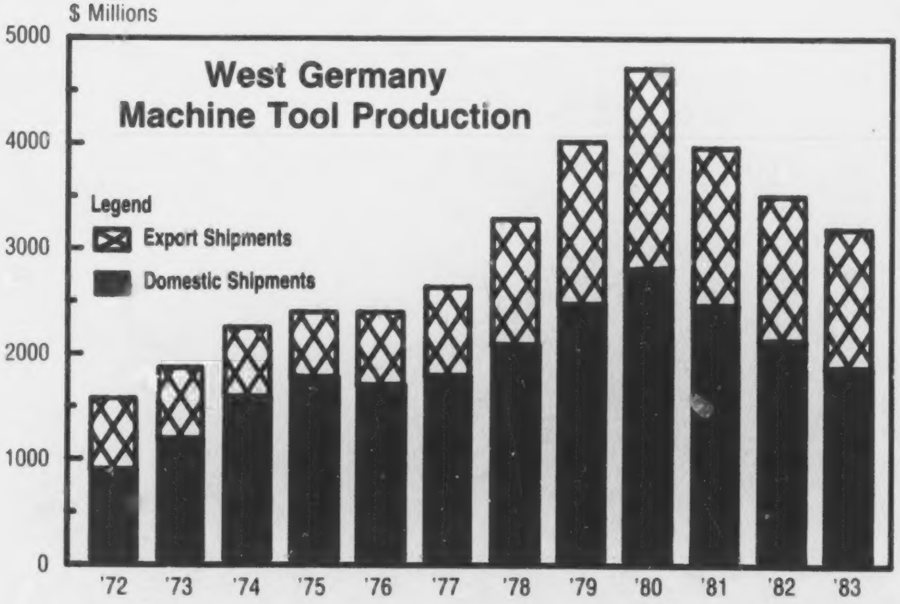
THE GERMAN MACHINE TOOL INDUSTRY (a)
1965 to Date

Year	Employees (Year-End)	Per Cent of Production Exported	Imports as Per Cent of Exports	Production Per Employee
		Per Cent of Value		U.S. $
1965	115,000	47.3%	24.2%	$7,564
1966	112,500	54.9	18.0	7,800
1967	108,000	62.9	11.5	7,943
1968	110,000	68.3	12.6	8,069
1969	120,000	59.1	20.6	9,869
1971	120,000	49.3	26.7	15,370
1972	113,000	55.7	21.2	15,896
1973	112,000	61.3	15.8	19,403
1974	111,500	69.0	12.8	23,411
1975	102,000	72.7	13.0	26,973
1976	96,500	70.2	9.5	28,521
1977	99,000	69.7	18.7	31,456
1978	98,700	65.0	22.9	39,412
1979	100,000	61.9	26.1	48,360
1980(r)	98,000	62.6	29.2	55,497
1981(r)	97,000	65.6	26.0	46,858
1982(r)	93,000	60.7	22.1	43,377
1983	83,700	58.6	23.1	43,989

r - Revised.

(a) Figures include parts.

Sources: VDMA, "Statistisches Handbuch für den Maschinenbau", annually, "Die Lage des Maschinenbaues im Jahre," annually, and official foreign trade statistics.



GERMAN PRODUCTION OF MACHINE TOOLS
1980 to Date
(Values in Thousands of U.S. Dollars)

Machine Classifications	1980		1981		1982		1983	
	Units	Value	Units	Value	Units	Value	Units	Value
GRAND TOTAL	233,831	$5,438,742	216,778	$4,545,215	184,967	$4,034,050	156,562	$3,681,878
Metal Cutting Total	138,655	$3,770,976	121,471	$3,145,718	89,461	$2,763,248	89,810	$2,557,399
Planing, Shaping and Broaching	886	45,317	896	52,257	658	42,134	518	27,430
Lathes	10,320	419,965	9,969	366,585	7,263	292,209	6,325	289,814
Turret Lathes, Automatic	4,562	465,188	3,801	380,690	2,855	307,676	2,487	288,548
Drilling	21,387	200,751	18,916	132,359	13,707	111,526	13,297	98,993
Milling Machines, Horizontal Boring and Milling Machines	9,115	551,649	8,568	503,112	6,831	410,129	7,763	376,006
Saws and Filing Machines	20,575	127,556	18,312	103,284	14,761	87,414	18,375	71,478
Grinding, Honing and Polishing	55,912	570,244	45,998	478,880	29,926	447,968	27,931	375,684
Gear Cutting Machines	1,240	159,065	1,337	142,610	1,043	121,130	785	97,280
Other Metal Cutting Machine Tools	14,658	766,381	13,674	614,377	12,417	605,704	12,329	626,397
Parts and Accessories	—	464,861	—	371,566	—	337,358	—	305,769
Metal Forming Total	95,176	1,667,766	95,307	1,399,498	95,506	1,270,802	66,752	1,124,479
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	6,764	167,908	5,882	150,042	5,425	134.807	3,909	130,647
Mechanical Presses	9,018	295,522	8,203	252,339	9,437	193,607	10,256	157,383
Hydraulic Presses	2,466	268,862	2,095	215,548	2,113	230,467	2,279	215,142
Sheet Metalworking Machines, Including Shears	67,334	311,890	70,999	292,365	71,671	288,854	42,868	248,599
Wire Working Machines	8,670	253,970	7,171	211,965	6,409	198,912	7020	157,783
Bolt, Screw and Nut Making Machines	924	102,754	957	57,010	451	30,313	420	32,278
Parts and Accessories	—	266,859	—	220,227	—	191,842	—	182,646

Notes: German Federal Republic includes West Berlin. Totals include some unclassified items.

Exchange Rate: 1980 $1 = 1.818 Deutsche Mark; 1981 $1 = 2.260 Deutsche Mark, 1982 $1 = 2.4266 Deutsche Mark, 1983 $1 = 2.5533 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Fachgemeinschaft Werkzeugmaschinen, from official foreign trade statistics.

Detailed statistics supplied by individual countries may differ in value figures from those given in the International Statistics on Machine Tools. Problems in the conversion of national currencies into dollars and differing reporting practices probably account for most of the discrepancies.

GERMAN EXPORTS OF MACHINE TOOLS
1981 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1981		1982		1983	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	201,518	$2,982,722	182,980	$2,587,957	155,030	$2,282,825
Metal Cutting Total	169,747	$1,888,900	152,714	$1,624,741	127,622	$1,473,782
Planing, Shaping and Broaching	485	25,710	411	22,644	272	19,208
Lathes	3,535	231,366	3,941	179,976	2,552	194,120
Turret Lathes, Automatic	3,198	215,613	2,623	183,861	2,200	164,598
Drilling	7,308	82,764	6,522	87,275	5,986	94,404
Milling Machines, Horizontal Boring and Milling Machines	6,774	320,734	5,822	259,878	5,842	245,416
Saws and Filing Machines	15,387	69,137	10,459	61,681	8,382	48,024
Grinding, Honing and Polishing	126,983	358,304	117,637	342,567	98,036	281,654
Gear Cutting Machines	867	82,243	610	68,378	514	49,311
Other Metal Cutting Machine Tools	5,210	298,649	4,689	229,221	3,838	211,281
Parts and Accessories	—	204,379	—	189,259	—	165,766
Metal Forming Total	29,278	925,524	27,324	853,136	24,575	698,258
Hammers, Forging and Riveting Machines Bending and Straightening Machines	3,523	97,775	3,468	88,347	3,333	73,352
Mechanical Presses	3,001	163,621	3,026	118,971	3,278	62,297
Hydraulic Presses	1,796	67,457	1,347	71,242	2,088	76,362
Sheet Metalworking Machines, Including Shears	10,241	188,273	9,453	177,613	7,299	145,923
Wire Working Machines	5,103	150,044	5,035	150,257	4,165	116,945
Bolt, Screw and Nut Making Machines	673	48,083	580	37,612	497	25,130
Other Metal Forming Machine Tools	4,941	48,995	4,415	49,433	3,915	62,451
Parts and Accessories	—	161,277	—	159,660	—	135,798
Other Metal Working Machines (including Parts and Accessories)	2,493	168,299	2,942	110,080	2,833	110,785

Exchange rate: 1981 $1 = 2.260 Deutsche Mark; 1982 $1 = 2.4266 Deutsche Mark; 1983 $1 = 2.5533 Deutsche Mark.

Note: Individual items may not add to total due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN IMPORTS OF MACHINE TOOLS
1981 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1981		1982		1983	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	76,724	$774,776	59,703	$622,904	64,020	$586,445
Metal Cutting Total	58,159	$519,960	42,217	$415,089	46,445	$371,864
Planing, Shaping and Broaching	153	1,264	108	1,569	103	2,840
Lathes	8,692	87,114	5,659	60,670	5,369	45,936
Turret Lathes, Automatic	1,040	42,376	683	28,838	587	25,818
Drilling	7,467	58,249	6,287	47,560	5,272	45,711
Milling Machines, Horizontal Boring and Milling Machines	4,586	115,373	4,077	86,192	3,837	79,579
Saws and Filing Machines	9,723	11,722	6,321	9,107	4,820	7,670
Grinding, Honing and Polishing	23,643	88,740	16,432	75,631	22,799	62,318
Gear Cutting Machines	114	8,847	66	8,880	57	7,956
Other Metal Cutting Machine Tools	2,741	35,600	2,584	35,432	3,601	35,384
Parts and Accessories	—	70,675	—	61,210	—	58,652
Metal Forming Total	14,992	219,450	12,028	176,356	13,934	178,749
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	2,343	20,338	1,356	9,841	1,778	11,708
Mechanical Presses	2,105	15,514	1,673	8,305	2,020	10,745
Hydraulic Presses	1,610	14,274	1,056	9,034	1,139	9,123
Sheet Metalworking Machines, Including Shears	3,732	39,720	3,199	38,807	3,963	40,055
Wire Working Machines	2,028	29,454	1,674	26,128	1,784	26,376
Bolt, Screw and Nut Making Machines	295	10,938	217	8,036	185	7,923
Other Metal Forming Machine Tools	2,879	18,302	2,853	15,616	3,065	13,591
Parts and Accessories	—	70,909	—	60,590	—	59,228
Other Metal Working Machines (including Parts and Accessories)	3,573	35,365	5,458	31,459	3,641	35,832

Exchange rate: 1981 $1 = 2.260 Deutsche Mark; 1982 $1 = 2.4266 Deutsche Mark; 1983 $1 = 2.5533.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN EXPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine & By Destination, 1983

(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$1,308,016	$94,404	$49,311	$281,654	$164,598	$194,120	$245,416	$48,024	$19,208	$211,281
EUROPE	964,566	74,076	31,207	185,153	141,534	145,704	167,574	34,666	14,248	170,405
France	149,393	11,365	6,832	32,968	26,221	14,712	22,339	6,944	1,970	26,042
Belgium-Luxembourg	27,597	1,825	2,356	5,908	4,154	4,095	4,644	1,701	62	2,852
Netherlands	24,207	1,466	387	4,833	2,431	3,342	7,036	1,797	81	2,833
Italy	43,821	1,493	2,274	13,747	4,349	3,405	4,971	2,180	190	11,214
United Kingdom	60,774	2,851	1,037	11,885	8,067	11,413	14,718	4,278	954	5,570
Denmark	10,215	1,403	16	1,523	1,471	1,473	2,118	1,057	88	1,065
Norway	3,948	138	—	805	577	540	311	989	—	589
Sweden	40,263	2,472	1,214	6,578	6,130	3,813	5,836	2,314	464	11,442
Switzerland	45,790	3,463	1,137	9,430	5,428	3,406	15,659	2,129	126	5,013
Austria	40,806	3,212	254	10,209	5,013	5,554	10,005	2,330	119	4,110
Portugal	3,632	84	139	1,459	122	265	1,146	237	—	180
Spain	21,806	749	3,296	4,585	4,121	975	4,088	282	428	3,282
Yugoslavia	55,261	5,601	1,106	9,744	10,251	6,513	15,753	438	1,559	4,296
U.S.S.R.	328,375	23,831	8,310	40,607	49,771	78,526	39,966	3,333	6,468	77,564
Poland	12,464	2,085	109	3,827	1,721	1,422	2,993	190	2	115
Czechoslovakia	20,988	1,659	177	10,638	916	1,157	4,150	1,614	—	677
Hungary	7,183	394	173	2,926	999	313	886	127	59	1,308
Romania	3,174	3	14	289	—	1,307	786	—	—	775
Bulgaria	30,295	4,544	1,312	7,357	7,040	1,115	6,327	247	1,290	1,063
AFRICA	35,680	3,696	783	10,394	1,796	7,606	5,177	1,749	876	3,604
South Africa	17,482	2,140	783	6,259	313	2,145	2,223	805	584	2,230
AMERICA	118,652	4,558	4,491	36,038	9,191	18,653	29,030	4,829	1,041	10,832
United States	69,379	2,518	3,827	28,099	4,933	1,127	16,483	3,783	92	8,518
Canada	9,893	473	18	1,941	307	2,675	2,945	721	16	796
Mexico	13,387	1,045	388	1,872	749	3,089	4,553	169	478	1,045
Venezuela	566	—	—	20	98	—	408	30	9	—
Brazil	11,652	306	225	3,045	2,250	3,933	1,289	17	407	181
Chile	646	7	—	268	5	332	26	5	2	—
Argentina	4,578	137	23	393	734	19	3,116	10	—	147
ASIA	184,934	11,775	12,525	48,126	12,056	22,001	43,022	6,133	3,043	26,252
Iraq	25,743	4,367	1,313	3,446	260	4,873	7,837	489	1,470	1,686
Israel	9,053	131	25	836	1,427	1,257	4,257	365	—	754
Other Near East	28,041	1,102	143	5,711	1,431	4,100	10,454	2,472	662	1,964
India	35,199	4,513	2,803	9,587	2,718	4,186	7,816	655	80	2,842
Indonesia	4,589	240	—	1,351	—	364	511	240	—	1,882
Singapore	3,713	198	—	509	463	179	885	302	—	1,178
China	8,314	—	764	3,442	396	183	801	72	—	2,656
Japan	32,666	92	4,611	12,032	634	2,062	927	616	—	11,691
Taiwan	11,049	158	614	2,503	1,310	1,347	4,657	29	—	431
AUSTRALIA & OCEANA	4,184	300	316	1,943	22	156	613	647	—	188
Australia	3,861	286	316	1,785	—	107	610	571	—	188

Exchange Rate: $1 = 2.5533 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN EXPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1983

(Thousands of U.S. Dollars)

Country of Destination	Total (a)	Hammers, Forging & Riveting, Bending, & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$562,460	$73,352	$62,297	$76,362	$145,923	$116,945	$25,130	$62,451
EUROPE	359,319	51,242	39,106	49,400	100,222	61,320	14,181	43,848
France	53,157	5,005	7,345	4,851	15,790	7,491	2,863	9,812
Belgium-Luxembourg	12,744	258	1,861	2,187	4,948	2,316	174	1,000
Netherlands	11,222	548	1,917	1,131	4,135	2,174	300	1,019
Italy	31,340	10,278	3,013	3,065	4,686	3,214	2,279	4,806
United Kingdom	32,217	3,423	2,122	4,630	10,129	7,480	1,119	3,315
Denmark	4,370	197	703	34	2,333	470	13	621
Norway	4,918	258	157	286	3,055	906	31	225
Sweden	17,650	370	1,762	1,628	8,650	1,948	999	2,293
Switzerland	17,348	806	1,529	3,677	6,455	2,721	491	1,670
Austria	20,668	1,739	2,631	5,698	5,376	2,612	224	2,389
Portugal	10,765	54	226	108	174	9,890	15	297
Spain	13,885	2,609	4,249	502	1,764	2,369	1,193	1,199
Yugoslavia	25,517	4,270	1,004	13,056	3,512	2,223	817	636
U.S.S.R.	47,155	12,804	7,041	1,658	14,560	3,447	482	7,164
Poland	3,378	915	14	1,076	238	927	—	208
Czechoslovakia	8,608	1,693	1,312	4	2,718	1,521	1,200	161
Hungary	4,448	22	775	163	1,306	431	14	1,737
Romania	3,125	1,668	—	—	—	—	—	1,457
Bulgaria	10,213	204	257	3,115	2,860	543	352	2,882
AFRICA	49,562	3,218	8,378	4,804	14,874	14,492	[illegible]	2,692
South Africa	23,238	1,954	5,957	2,381	7,443	3,759	937	808
AMERICA	63,198	10,318	6,495	6,738	14,861	17,386	3,197	4,202
United States	45,901	9,429	3,498	5,792	11,041	11,236	2,837	2,066
Canada	4,267	86	799	37	1,560	1,487	—	298
Mexico	2,203	—	590	438	492	457	2	224
Venezuela	1,272	449	6	326	18	455	—	18
Brazil	5,479	64	748	13	444	2,611	184	1,414
Chile	55	—	14	—	—	—	42	—
Argentina	1,588	186	49	41	325	891	—	96
ASIA	86,499	8,369	8,219	15,276	14,690	22,530	6,511	10,904
Iraq	12,781	794	1,771	8,483	260	1,363	111	—
Israel	3,680	91	100	138	1,144	2,009	87	111
Other Middle East	22,147	1,339	1,892	3,256	4,375	8,029	980	2,277
India	13,354	3,061	862	1,227	2,424	1,314	601	3,865
Indonesia	4,351	46	591	239	2,435	738	183	119
Singapore	3,865	85	310	145	357	1,149	114	1,706
China	4,168	290	7	12	2,129	1,081	—	649
Japan	9,608	817	603	691	465	2,211	3,907	914
Taiwan	2,838	1,054	342	301	84	579	—	477
AUSTRALIA & OCEANA	3,882	205	99	144	1,276	1,216	136	805
Australia	3,521	173	90	113	1,015	1,198	127	805

Exchange Rate: $1 = 2.5533 Deutsche Mark.

(a) Includes other metalworking machines.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine & By Destination, 1983
(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$313,212	$45,711	$7,956	$62,318	$25,818	$45,936	$79,579	$7,670	$2,840	$35,384
EUROPE										
France	14,347	1,064	27	1,496	3,920	1,627	4,334	583	419	876
Belgium-Luxembourg	10,723	3,504	287	1,003	176	2,827	2,805	27	—	94
Netherlands	5,322	694	42	2,823	131	409	567	267	40	349
Italy	31,947	3,185	117	7,364	1,820	3,468	12,315	1,883	841	954
United Kingdom	10,231	708	204	2,591	533	1,917	2,456	322	1,141	361
Denmark	991	51	—	578	86	56	163	27	—	31
Sweden	9,809	544	—	6,894	1,441	309	469	52	22	78
Switzerland	112,415	15,733	2,373	29,263	9,357	6,236	27,503	1,175	183	20,593
Austria	13,077	614	3	3,341	296	6,037	1,961	510	108	206
Spain	7,154	661	—	250	598	1,011	4,041	241	49	302
Yugoslavia	1,227	—	—	438	40	76	642	31	—	—
U.S.S.R.	2,846	117	—	312	60	840	1,514	—	3	—
Poland	1,231	78	—	117	—	884	124	29	—	—
Czechoslovakia	5,128	346	—	454	123	1,504	2,696	—	5	—
Hungary	7,647	1,270	—	67	129	2,383	3,775	—	23	—
Romania	270	—	—	5	—	43	221	—	—	—
Other Europe	2,991	207	—	12	70	1,181	280	468	—	773
United States	12,766	2,045	4,736	3,550	736	146	1,046	178	4	325
Japan	52,728	10,363	—	728	5,833	12,053	11,825	1,619	—	10,306
Other Countries	10,360	4,528	166	1,032	468	2,928	841	257	4	136

Exchange Rate: $1 = 2.5533 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL FORMING MACHINE TOOLS
By Type of Machine & By Destination, 1983
(Thousands of U.S. Dollars)

Origin	Total (a)	Hammers, Forging & Riveting, Bending & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines	Other Metal Working Machines
TOTAL	$119,521	$11,708	$10,745	$9,123	$40,055	$26,376	$7,923	$13,591	NA
EUROPE									
France	9,415	504	412	1,154	4,065	772	199	2,309	NA
Belgium-Luxembourg	7,178	165	1,069	1,699	1,853	390	1,529	474	NA
Netherlands	7,029	626	186	829	4,476	278	196	438	NA
Italy	19,545	2,839	2,172	731	5,577	3,690	1,417	3,118	NA
United Kingdom	5,180	732	384	401	1,538	504	25	1,596	NA
Denmark	2,162	240	25	423	1,322	59	11	81	NA
Sweden	3,103	94	750	952	663	494	18	132	NA
Switzerland	33,196	2,151	2,162	2,397	11,791	10,014	783	3,899	NA
Austria	5,682	574	69	167	1,375	2,993	33	471	NA
Spain	2,954	192	599	78	208	1,771	51	55	NA
Yugoslavia	369	—	46	2	—	304	—	17	NA
U.S.S.R.	49	—	21	—	28	—	—	—	NA
Poland	86	—	—	—	5	81	—	—	NA
Czechoslovakia	2,827	2,244	494	12	77	—	—	—	NA
Hungary	640	—	43	3	179	380	—	35	NA
Romania	116	—	—	—	116	—	—	—	NA
Other Europe	1,569	276	136	146	279	524	6	201	NA
United States	10,645	891	1,493	121	3,647	3,271	891	330	NA
Japan	5,747	2	659	9	2,556	474	1,739	310	NA
All Other Countries	2,029	179	22	—	301	376	1,025	125	NA

NA - Not Available. Exchange Rate: $1 = 2.5533 Deutsche Mark.

(a) Totals for individual countries exclude other metalworking machinery and exclude parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

JAPANESE PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF METAL CUTTING MACHINE TOOLS, 1964 to Date

(Millions of U.S. Dollars)

	Production	Imports	Exports	Domestic Consumption
1964	$ 252.5	$ 59.2	$ 18.1	$ 293.7
1965	195.4	38.8	24.8	209.4
1966	212.4	21.1	40.6	192.9
1967	350.1	35.7	49.0	336.8
1968	488.9	94.9	51.6	532.2
1969	666.6	95.8	60.4	702.0
1970	867.6	122.7	66.9	923.4
1971	750.5	113.6	80.1	783.2
1972	675.6	74.1	90.8	658.9
1973	1,117.0	78.3	129.3	1,066.0
1974	1,230.2	127.6	197.8	1,160.0
1975	774.9	72.7	207.6	640.0
1976	764.3	46.8	256.5	554.6
1977	1,165.1	58.5	430.1	793.5
1978	1,738.7	93.3	770.4	1,061.6
1979	2,208.9	119.6	942.8	1,385.7
1980	3,012.3	168.6	1,188.9	1,992.0
1981	3,860.3	175.1	1,409.2	2,626.3
1982	3,141.5	175.0	994.1	2,322.4
1983(p)	2,953.6	136.9	999.7	2,090.8

p - Preliminary.

Exchange rate: 1964-1970 $1 = 360 Yen; 1971 $1 = 350 Yen; 1972 $1 = 302 Yen; 1973 $1 = 272.5 Yen; 1974 $1 = 291.51 Yen; 1975 $1 = 296.8 Yen; 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52.

Sources: Japan, Ministry of International Trade and Industry, and Ministry of Finance.

JAPANESE PRODUCTION, IMPORTS, AND EXPORTS OF METAL FORMING MACHINE TOOLS, 1965 to Date

(Values in Millions of U.S. Dollars)

	Production		Total Exports	Total Imports
Year	Units	Value	Value	
1965	15,910	$ 72.8	$ 6.6	$12.3
1966	17,229	60.1	12.0	10.6
1967	17,571	106.2	9.1	15.4
1968	21,905	160.8	12.9	38.9
1969	23,033	195.8	18.3	39.4
1970	26,345	241.5	24.3	37.5
1971	16,466	202.0	34.3	40.6
1972	19,720	216.3	54.9	29.2
1973	27,168	360.1	86.4	31.6
1974	23,854	420.0	109.8	48.6
1975	12,447	284.8	105.6	51.3
1976	15,978	294.6	113.4	24.1
1977	16,326	438.0	186.0	27.5
1978	18,526	613.7	241.1	26.8
1979	23,995	687.1	286.6	45.0
1980	28,598	818.0	264.0	52.5
1981	27,961	936.8	276.3	40.4
1982	20,443	653.3	269.3	45.3
1983	21,894	584.4	254.4	34.1

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY

Number of Employees, 1964 to Date

Year	Employees	Year	Employees
1964	38,626	1974	45,295
1965	37,377	1975	40,925
1966	33,719	1976	34,509
1967	35,141	1977	32,168
1968	40,092	1978	28,154
1969	44,806	1979	31,113
1970	49,161	1980	33,737
1971	50,630	1981(r)	33,420
1972	46,738	1982(r)	34,204
1973	45,242	1983	33,755

r - Revised.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE PRODUCTION, EXPORTS, AND IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1982 and 1983

(Values in Thousands of U.S. Dollars)

Type of Machine	1982 Production	1982 Exports	1982 Imports	1983 Production	1983 Exports	1983 Imports
Total						
Units	20,433	24,396	2,968	21,894	428,645	2,366
Value	$653,258	$269,303	$45,260	$584,435	$254,366	$34,060
Hydraulic Presses						
Units	5,634	1,945	83	6,959	1,619	54
Value	$129,211	$ 34,969	$ 5,401	$138,759	$ 43,681	$ 4,071
Mechanical Presses						
Units	8,425	2,020	553	8,399	401,986(a)	395
Value	$377,956	$ 79,799	$ 6,340	$305,848	$ 45,259	$ 6,900
Forging & Stamping Machines						
Units	350	293	146	302	320	14
Value	$ 22,116	$ 13,455	$15,812	$ 19,868(b)	$ 53,381	$ 3,651
Shearing Machines						
Units	4,362	6,031	663	4,492	7,785	284
Value	$ 60,618	$ 50,267	$ 2,654	$ 63,313	$ 51,280	$ 4,648
Bending Machines						
Units	771	4,183	229	773	4,590	170
Value	$ 29,697	$ 29,095	$ 3,044	$ 20,840	$ 28,983	$ 3,132
Wire Forming Machines						
Units	891	259	3	969	193	7
Value	$ 33,660	$ 9,472	$ 76	$ 35,808	$ 5,389	$ 598
Other Metal Forming Machines						
Units	—	9,665	1,289	—	12,152	1,442
Value	—	$ 52,247	$11,155	—	$ 54,888	$11,060

NA - Not Available. Exchange rate: 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen.

(a) Mechanical press export units is extremely high and may be considered in error.

(b) Does not include Stamping.

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE PRODUCTION, EXPORTS AND IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine, 1983

(Values in Thousands of U.S. Dollars)

	Production		Exports		Imports	
	Units	Value	Units	Value	Units	Value
TOTAL, (incl. NC)	140,088	$2,953,608	296,306	$999,684	10,879	$136,902
Horizontal Boring Machines	234	26,815	228	15,674	6	817
Jig Boring Machines	1,099	33,147	33	2,850	5	682
Boring Machines, NC	140	42,236	37	11,873	6	1,402
Boring Machines, N.E.C.	625	6,231	480	10,669	13	72
Radial Drilling Machines	949	11,283	175	2,114	—	—
Multi-Spindle Drilling Machines	587	10,685	389	19,868	—	—
Upright Drilling Machines	1,327	4,509	192	669	—	—
Drilling Machines, NC	501	17,817	233	15,195	50	1,903
Drilling Machines, N.E.C.	26,155	12,483	6,658	7,153	1,528	9,469
Gear Hobbing Machines	306	16,428	118	5,090	46	1,861
Gear Making Machines	412	23,922	90	4,884	60	8,492
External Grinding Machines	1,337	59,098	166	12,028	139	3,747
Internal Grinding Machines	613	38,691	96	4,854	26	1,587
Surface Grinding Machines	4,739	78,515	870	13,275	733	13,047
Grinding Machines, NC	338	24,225	94	10,837	83	6,593
Grinding Machines, N.E.C.	2,748	92,022	17,749	41,719	3,848	18,226
Center Lathes	3,976	51,937	994	12,753	879	5,242
Copying Lathes	18	173	93	1,827	2	400
Turret Lathes	66	1,697	74	1,869	5	236
Automatic Lathes	5,801	82,220	923	25,577	91	1,920
Vertical Lathes	63	7,515	34	3,932	7	442
Lathes, NC	10,020	511,309	3,705	251,284	61	3,073
Lathes, N.E.C.	1,870	13,047	752	4,235	92	2,884
Knee Type Machines	4,570	64,112	321	5,776	273	2,295
Milling Machines, NC	2,467	141,824	361	34,140	6	450
Milling Machines, N.E.C.	2,675	68,819	2,164	22,007	1,342	6,892
Planing Machines	68	9,650	28	1,831	2	286
Machining Centers	7,833	702,913	3,438	331,092	—	—
Other NC Machines	5,099	354,223	—	—	75	11,330
Broaching Machines	186	10,504	255,811	124,613	3	152
Special Machines	3,236	321,762			—	—
All Other Metal Cutting, N.E.C.	50,030	113,793			1,498	33,408

Exchange rate: $1 = 237.52 Yen.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine, For Selected Destinations, 1983

(Values in Thousands of U.S. Dollars)

	Destination									
Type of Machine	U.S.A.	West Germany	Belgium	United Kingdom	Israel	U.S.S.R	Korea	Taiwan	India	Singapore
GRAND TOTAL										
UNITS	132,375	3,927	737	7,271	776	579	2,154	9,487	278	11,347
VALUE	$364,517	$53,920	$39,112	$38,056	$20,003	$69,880	$93,007	$38,102	$24,768	$20,912
Boring Machines										
Units	34	—	—	2	—	37	53	62	24	16
Value	$ 4,555	—	—	$168	—	$ 6,109	$ 9,001	$ 2,404	$ 3,288	$ 67
Drilling Machines										
Units	800	479	35	451	43	15	524	450	22	739
Value	$ 5,978	$ 749	$ 13	$ 493	$ 63	$ 5,452	$16,344	$ 1,069	$ 122	$ 1,166
Gear Cutting & Finishing										
Units	3	—	—	2	—	19	44	45	10	7
Value	$ 505	—	—	$ 76	—	$ 594	$ 3,958	$ 1,709	$ 905	$ 211
Grinding Machines										
Units	2,196	46	5	2,118	—	201	532	297	80	2,465
Value	$ 13,691	$ 1,351	$ 202	$ 2,960	—	$10,951	$21,101	$ 5,650	$ 5,448	$ 3,949
Lathes										
Units	1,981	711	277	453	100	104	313	408	49	192
Value	$120,167	$15,851	$15,628	$16,618	$ 8,513	$17,447	$11,944	$ 7,355	$ 5,709	$ 6,652
Milling Machines										
Units	1,750	58	—	39	5	14	186	171	5	98
Value	$ 10,172	$ 1,309	—	$ 417	$ 981	$ 4,690	$14,028	$ 5,898	$ 1,339	$ 2,657
Planing Machines										
Units	—	—	—	—	—	—	1	3	—	—
Value	—	—	—	—	—	—	$ 84	$ 610	—	—
Machining Centers										
Units	1,957	242	271	157	84	82	29	45	29	22
Value	$170,584	$20,297	$23,249	$14,386	$10,109	$20,487	$ 3,865	$ 4,951	$ 6,353	$ 2,349
Other Metal Cutting Machines										
Units	123,654	2,391	149	4,049	544	107	372	8,006	59	7,808
Value	$ 38,864	$14,361	$ 21	$ 2,934	$ 341	$ 4,143	$12,689	$ 8,458	$ 1,600	$ 3,861

Exchange Rate: $1 = 237.52 Yen.

Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

JAPANESE PRODUCTION OF NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1977 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1977	1978	1979	1980	1981	1982	1983
GRAND TOTAL							
Units	5,436	7,336	14,317	22,069	25,926	24,048	26,398
Value	$299,980	$510,463	$937,423	$1,496,512	$1,967,642	$1,687,203	$1,794,548
Boring Machines							
Units	37	49	52	103	135	134	140
Value	$ 7,024	$ 18,772	$ 17,293	$ 35,652	$ 57,298	$ 44,529	$ 42,236
Drilling Machines							
Units	264	230	143	249	301	201	501
Value	$ 12,152	$ 10,952	$ 6,055	$ 8,710	$ 9,781	$ 7,380	$ 17,817
Milling Machines							
Units	394	549	979	1,451	2,381	2,308	2,467
Value	$ 20,591	$ 39,920	$ 61,026	$ 83,215	$ 138,430	$ 134,403	$ 141,824
Grinding Machines							
Units	51	21	93	154	235	296	338
Value	$ 3,169	$ 2,523	$ 7,401	$ 15,078	$ 19,653	$ 24,035	$ 24,225
Lathes							
Units	3,677	4,986	8,203	12,036	12,134	10,298	10,020
Value	$158,981	$274,918	$448,602	$ 672,891	$ 731,755	$ 560,823	$ 511,309
Special Machines							
Units	50	33	62	101	103	137	497
Value	$ 8,972	$ 8,567	$ 18,123	$ 28,370	$ 53,149	$ 39,795	$ 62,799
Elec. Discharge Machines							
Units	NA	NA	1,593	2,554	3,020	3,522	4,187
Value	NA	NA	$ 80,298	$ 143,541	$ 180,846	$ 196,932	$ 254,130
Machining Centers							
Units	926	1,371	2,927	5,231	7,393	6,936	7,833
Value	$ 86,175	$149,323	$277,935	$ 491,383	$ 749,644	$ 649,219	$ 702,913
Other NC Metal Cutting Machines							
Units	37	97	265	190	224	216	415
Value	$ 2,916	$ 5,488	$ 20,692	$ 17,671	$ 27,085	$ 30,086	$ 37,294

NA - Not Available.

Exchange rate: 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE TRADE WITH THE UNITED STATES NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1983

(Values in Thousands of U.S. Dollars)

Type of Machine	Exports to U.S.		Imports from U.S.	
	Units	Value	Units	Value
Boring Machines	11	$ 2,320	1	$ 463
Drilling Machines	119	4,863	1	4
Grinding Machines	28	3,726	6	1,865
Lathes	1,781	114,917	3	307
Milling	180	8,176	1	269
Machines Centers	1,957	170,584	—	—
Other	—	—	7	316

Exchange Rate: $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS

Selected Destinations, 1981 to Date

(Values in Thousands of U.S. Dollars)

Destination	1981		1982		1983	
	Units	Value	Units	Value	Units	Value
TOTAL EXPORTS	301,567	$1,409,164	218,823	$994,082	296,306	$999,684
North & South America						
Brazil	202	$ 6,312	251	$ 14,302	70	$ 10,197
Canada	16,187	27,434	13,119	12,857	23,408	13,889
Mexico	384	14,492	300	48,332	157	1,958
U.S.A.	137,009	691,099	62,208	446,220	132,875	364,517
Western Europe						
Belgium	2,032	34,948	3,279	24,862	737	39,112
France	3,805	25,697	4,684	19,016	4,935	15,136
Netherlands	670	6,090	1,103	5,413	2,422	5,338
Norway	634	5,210	457	3,228	475	1,857
Sweden	1,066	22,877	795	12,572	1,347	14,268
United Kingdom	4,387	50,864	4,548	43,907	7,271	38,056
West Germany	4,395	87,172	2,889	47,649	3,927	53,920
Eastern Europe						
Poland	110	10,452	—	—	9	1,183
Rumania	21	6,149	1	56	—	—
U.S.S.R.	486	49,581	618	42,851	579	69,880
Asia						
Burma	78	453	86	827	168	530
Korean Republic	1,267	30,821	1,274	25,553	2,154	93,007
People's Republic of	278	15,095	368	5,967	605	5,894
Philippines	2,009	3,496	2,028	4,975	1,660	1,895
Singapore	6,681	27,792	7,344	26,898	11,347	20,912
Taiwan	9,316	46,787	7,644	36,362	9,487	38,102
Thailand	5,156	7,477	5,699	6,075	7,031	6,450
All Other Countries						
Australia	24,152	56,178	21,215	37,723	17,669	15,893
South Africa	4,305	48,488	2,936	12,495	5,711	12,003
All Other Countries	76,937	134,199	75,977	115,942	62,762	175,686

Exchange rate: 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS TO THE U.S.
1978-1983

(Values in Thousands of U.S. Dollars, F.O.B. Japan)

	Total	Lathes	Drilling Machines	Boring Machines	Milling Machines	Grinding Machines	Other
1978							
Units	58,742	2,891	2,281	161	7,661	1,275	44,473
Value	$193,006	$112,572	$5,440	$10,624	$ 9,640	$13,684	$ 41,046
1979							
Units	72,169	3,477	906	191	5,083	1,045	61,467
Value	$321,426	$181,813	$6,123	$17,726	$11,731	$16,905	$ 87,129
1980							
Units	54,228	4,109	1,053	210	3,426	1,843	43,587
Value	$471,131	$232,110	$8,963	$22,046	$26,430	$29,019	$152,543
1981							
Units	137,009	4,675	1,427	203	859	3,205	126,640
Value	$691,099	$337,151	$7,831	$20,528	$38,253	$27,865	$259,470
1982							
Units	62,208	2,799	1,007	96	1,877	3,213	53,216
Value	$446,220	$196,149	$3,839	$15,844	$16,398	$25,220	$188,769
1983							
Units	132,375	1,981	800	34	1,750	2,196	125,614
Value	$364,517	$120,167	$5,978	$ 4,555	$10,172	$13,691	$209,953

Exchange rate: 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
From Selected Countries, 1981 to Date

(Values in Thousands of U.S. Dollars)

	1981		1982		1983	
Country of Origin	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	17,244	$175,137	12,972	$175,005	10,879	$136,902
United States	1,790	$ 35,655	1,245	$ 44,513	1,068	$ 38,275
Western Europe						
Austria	784	263	740	891	228	206
France	671	1,954	500	875	424	530
Italy	85	2,118	68	1,859	53	2,021
Sweden	141	2,467	106	1,602	107	669
Switzerland	847	41,155	615	35,993	746	28,549
United Kingdom	427	3,992	250	1,863	155	1,373
West Germany	1,225	53,535	1,200	47,589	734	39,352
Eastern Europe						
Czechoslovakia	73	11,687	11	887	8	674
East Germany	46	7,106	41	7,011	20	1,831
Poland	—	—	—	—	—	—
U.S.S.R.	183	2,435	277	3,806	172	3,238
Asia						
Singapore	737	7,214	694	6,661	650	6,101
Taiwan	8,879	6,294	5,914	6,107	5,833	3,608
Other Countries	1,356	9,332	1,311	15,348	681	10,475

Exchange rate: 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine and Selected Countries, 1983
(Values in Thousands of U.S. Dollars)

Type of Machine	Country of Origin					
	U.S.A.	West Germany	Switzerland	Singapore	Korea	Taiwan
GRAND TOTAL						
Units	1,068	734	746	650	530	5,833
Value	$38,275	$39,352	$28,549	$6,101	$5,877	$3,608
Boring Machines						
Units	5	3	12	—	2	—
Value	$ 585	$ 598	$ 434	—	$ 227	—
Drilling Machines						
Units	185	28	10		36	1,234
Value	$ 177	$ 8,492	$ 97	—	$1,722	$ 181
Gear Cutting and Finishing						
Units	17	23	46	—	4	—
Value	$ 1,688	$ 4,320	$ 3,520	—	$ 139	—
Grinding Machines						
Units	561	278	166	606	57	2,883
Value	$ 8,803	$17,199	$ 7,860	$5,785	$ 690	$ 328
Lathes						
Units	8	62	98	10	301	423
Value	$ 341	$ 1,111	$ 4,829	$ 46	$2,240	$2,076
Milling Machines						
Units	31	19	14	34	129	887
Value	$ 1,490	$ 3,798	$ 341	$ 274	$ 838	$ 918
Planing Machines						
Units	—	—	1	—	—	—
Value	—	—	$ 47	—	—	—
Other Metal Cutting Machines						
Units	261	321	399	—	1	406
Value	$25,189	$ 3,840	$11,271	—	$ 17	$ 109

Note: Individual items may not add to totals due to rounding.

Exchange rate: $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

UNITED KINGDOM NET NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS

1961 to Date

(Millions of Dollars)

Year	Net New Orders			Shipments			Unfilled Orders
	Total	Domestic	Foreign	Total	Domestic	Foreign	
1961	$ 356.3	$254.1	$102.2	$ 324.9	$244.5	$ 96.0	$328.2
1962	276.0	169.4	106.7	356.3	256.9	99.4	247.3
1963	265.4	171.3	94.1	319.2	209.7	109.6	193.0
1964	388.4	282.0	106.5	339.5	234.1	105.4	241.5
1965	442.0	322.0	120.0	395.9	272.9	123.0	292.0
1966	448.3	319.5	128.8	459.2	332.9	126.3	310.0
1967	446.6	276.7	169.9	473.7	342.8	130.9	279.2
1968	441.1	290.6	150.5	404.6	272.4	132.2	278.6
1969	569.3	361.7	207.6	453.8	285.8	168.0	394.1
1970	513.4	313.9	199.4	524.6	329.5	195.1	382.8
1971	380.9	199.8	181.1	513.1	300.6	212.4	261.8
1972	480.4	303.5	176.9	462.1	279.2	182.9	283.5
1973	701.2	429.1	272.1	487.2	286.8	200.4	473.0
1974	813.7	448.8	364.9	595.0	350.6	244.4	731.9
1975	548.4	321.5	226.9	723.0	414.2	308.8	510.6
1976	570.8	346.8	224.0	635.8	377.5	258.3	350.4
1977	839.8	553.5	286.3	707.1	443.5	263.6	471.4
1978	1,046.4	689.3	357.1	960.0	599.0	361.0	604.8
1979	1,260.3	771.6	488.7	1,205.9	793.6	412.3	742.7
1980	1,038.8	562.3	476.5	1,370.6	813.9	556.7	418.7
1981	865.3	273.2	592.1	885.3	480.6	404.7	304.2
1982(r)	576.8	NA	NA	744.4	NA	NA	157.5
1983(p)	470.3	NA	NA	563.4	NA	NA	NA

NA - Not Available. p - Preliminary. r - Revised.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM EMPLOYMENT IN THE MACHINE TOOL INDUSTRY

Number of Employees, 1967 to Date

Mid-Year	Employees	Mid-Year	Employees
1967	65,500	1977(r)	47,675
1968	63,600	1978(r)	48,500
1969	63,700	1979(r)	48,350
1970	65,100	1980(r)	46,350
1971	59,000	1981(r)	40,925
1972	50,100	1982(r)	35,750
1973	48,400	1983(p)	29,700
1974(r)	50,000		
1975(r)	49,100		
1976(r)	47,050		

p - Preliminary. r - Revised.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS
By Type of Machine, Units and Value, 1982 and 1983
(Values in Thousands of U.S. Dollars)

Type of Machine	1982 Units	1982 Value	1983 Units	1983 Value
TOTAL (excluding parts)	1,510	$173,532	1,720	$127,731
Drilling Machines Boring Machines Milling Machines	33	6,778	40	4,096
Machining Centers - Horizontal	54	19,679	50	16,687
Machining Centers - Vertical	130	13,871	110	9,102
Machining Centers (manual tool change) and Indexing Turret	437	25,848	650	29,582
Lathes	573	68,644	650	37,925
Other Numerically Controlled Machines	283	38,711	220	30,340

Exchange Rate: 1982: 1 Pound = $1.7505; 1983: 1 Pound = $1.517.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM ORDERS AND SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS
1967 to Date
(Values in Thousands of Dollars)

	New Orders				Shipments			
	Total		Foreign		Total		Foreign	
Year	Units	Value	Units	Value	Units	Value	Units	Value
1967(a)	469	$ 18,059	101	$ 6,099	458	$ 25,102	NA	$ 8,877
1968(a)	505	34,157	130	10,904	558	28,500	109	6,113
1969(a)	693	42,245	248	16,596	543	35,105	189	14,738
1970(a)	725	52,561	350	26,978	600	37,773	241	15,848
1971	343	26,320	156	12,842	590	44,591	280	23,023
1972	548	42,199	189	14,551	381	27,173	150	12,735
1973	634	44,562	238	18,884	462	30,379	178	13,255
1974	739	65,520	353	32,362	709	37,452	246	15,171
1975	283	28,833	70	8,610	739	52,719	271	20,898
1976	535	57,429	157	17,820	612	48,635	192	17,598
1977	614	78,484	155	22,406	724	58,307	NA	17,347(b)
1978	681	105,986	209	26,135	969	102,376	245	29,086
1979	1,262	180,516	399	48,063	1,058	139,125	251	36,078
1980	978	160,736	397	60,193	1,240	198,985	421	54,712
1981(r)	1,237	192,812	398	75,702	1,196	165,037	399	56,167
1982(r)	1,369	124,576	NA	29,314	1,510	173,532	NA	71,301
1983(p)	2,000	128,945	NA	NA	1,720	127,731	NA	NA

NA - Not Available. p - Preliminary. r - Revised.

(a) Includes parts.

(b) Does not include figures for Drilling, Boring or Milling Machines.

Source: The Machine Tool Trades Association, and United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL CUTTING MACHINE TOOLS (a)

By Type of Machine, Units and Value, 1982 and 1983

(Values in Thousands of U.S. Dollars)

	1982		1983	
Type of Machine	Units	Value	Units	Value
TOTAL	—	$428,131	—	$327,979
Boring Machines				
Fine	(b)	(b)	(b)	(b)
Horizontal	31	9,474	12	1,669
Jig, Vertical and Other	129	2,302	130	2,731
Drilling Machines				
Vertical	895	3,680	850	1,669
Radial and Other	232	4,756	90	2,276
Gear Cutting and Finishing Machines	(c)	(c)	(c)	(c)
Grinding and Polishing Machines				
Cylindrical—Universal	173	7,883	110	5,310
Cylindrical—External	103	4,439	100	4,551
Cylindrical--Internal	82	18,000	100	9,861
Surface	410	7,352	520	6,523
Other Grinding	NA	15,511	NA	8,192
Honing and Lapping	483	6,155	450	5,613
Lathes				
Automatic (excl. plugboard)	291	17,323	180	13,501
Plugboard	271	6,456	150	4,248
Center	5,583	44,254	7,500	43,993
Other	121	8,807	200	9,102
Milling Machines				
Knee and Column	1,528	27,829	1,520	18,356
Bed Type	76	6,088	220	7,585
Other	249	5,078		
Other Metal Cutting				
Sawing and Cut-Off	1,217	10,631	NA	15,170
Screwing and Threading	150	12,254	(c)	(c)
Transfer, Single Station and Unit Head Machines	624	89,946	750	49,303
Other Metal Cutting, N.E.C.	NA	22,965	NA	22,755
Parts for Metal Cutting Machine Tools	—	96,948	—	95,571

NA - Not Available.

(a) Excludes numerically controlled machines.
(b) Included in "Jig, Vertical and Other."
(c) Included in "Other Metal Cutting Machine Tools."

Exchange Rate: 1982: 1 Pound = $1.7505; 1983: 1 Pound = $1.517.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)
By Type of Machine, Units and Value, 1982 and 1983
(Values in Thousands of U.S. Dollars)

Type of Machine	1982		1983	
	Units	Value	Units	Value
TOTAL	—	$142,714	—	$107,708
Presses				
Hydraulic—Open Front Hydraulic—Straight, Extrusion & Other	289	20,612	(b)	(b)
Mechanical—Open Front	206	5,194	200	3,793
Mechanical—Straight Sided	(b)	(b)	(b)	(b)
Other Mechanical	(b)	(b)	(b)	(b)
Forging Machines	1,272	4,019	1,800	1,972
Shearing Machines	NA	15,917	NA	8,799
Plate & Sheet Bending & Forming	(b)	(b)	(b)	(b)
Bar, Tube & Section Drawing & Forming	2,316	17,405	2,700	15,777
Wire and Strip Drawing & Forming	226	7,018	170	3,034
Other Bending & Working incl. Sheet Metal	141	12,843	(b)	(b)
Riveting and Other Metal Forming	1,352	21,263	NA	39,442
Parts for Metal Forming Machine Tools	—	38,443	—	34,891

Exchange Rate: 1982: 1 Pound = $1.7505; 1983: 1 Pound = $1.517.

(a) Excludes numerically controlled machines.
(b) Included in "Riveting and Other Metal Forming."

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM IMPORTS AND EXPORTS OF MACHINE TOOLS
New and Used, for Selected Countries, 1983
(Values in Thousands of U.S. Dollars)

Imports		Exports			
Origin	Value	Destination	Value	Destination	Value
West Germany	$88,282,354	United States	$58,472,481	Saudi Arabia	$4,972,423
Japan	53,743,596	West Germany	26,091,798	Pakistan	4,807,050
U.S.A.	43,043,068	South Africa	23,849,681	Australia	4,439,314
Switzerland	21,175,943	France	23,805,720	Nigeria	4,419,252
Italy	20,256,214	U.S.S.R.	14,540,668	Israel	4,198,338
France	12,541,973	India	14,345,972	Netherlands	4,062,930
Sweden	10,733,169	Mexico	11,785,638	China	3,776,440
United Kingdom	9,261,199	East Germany	11,777,575	Denmark	2,536,888
Netherlands	5,985,959	Sweden	11,039,028	Turkey	2,532,768
Spain	5,367,220	Italy	7,019,517	Singapore	2,529,505
Belgium-Lux.	4,456,979	Canada	7,009,529	Taiwan	2,472,554
Taiwan	4,420,251	Switzerland	6,737,414	Austria	2,368,630
Austria	3,193,109	Belgium-Lux.	5,209,986	Spain	2,196,954
Denmark	2,455,557	Irish Republic	5,173,644	Egypt	2,142,784
Irish Republic	2,440,023	Poland	5,079,392	Japan	2,046,553

Exchange Rate: 1 Pound = $1.517.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1982

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	Rep. of So. Africa	West Germany	Mexico	France	India	Ireland
Grand Total (incl. N/C)								
Units	30,038	4,516	1,3[illegible]5	1,329	345	5,678	378	1,385
Value	$436,001	$102,867	$28,002	$24,599	$23,747	$22,997	$20,545	$15,860
Boring (incl. N/C)								
Units	651	154	18	38	6	28	10	11
Value	$ 30,435	$ 11,506	$ 471	$ 2,516	$ 467	$ 1,250	$ 2,157	$ 331
Boring, N/C								
Units	63	21	—	5	6	1	7	—
Value	$ 17,347	$ 7,781	—	$ 1,229	$ 467	$ 284	$ 1,938	—
Drilling (incl. N/C)								
Units	1,096	90	67	42	—	42	57	132
Value	$ 12,162	$ 3,034	$ 2,647	$ 531	—	$ 258	$ 341	$ 427
Drilling, N/C								
Units	25	10	2	1	—	1	—	—
Value	$ 4,151	$ 2,725	$ 195	$ 103	—	$ 68	—	—
Gear Cutting & Finishing (incl. N/C)								
Units	73	15	2	1	—	1	8	19
Value	$ 10,916	$ 1,461	$ 65	$ 123	—	$ 133	$ 890	$ 5,366
Gear Cutting & Finishing, NC								
Units	2	—	—	—	—	—	—	1
Value	$ 688	—	—	—	—	—	—	$ 430
Grinding & Polishing (incl. N/C)								
Units	73	15	2	1	—	1	8	19
Value	$ 10,916	$ 1,461	$ 65	$ 123	—	$ 133	$ 890	$ 5,366
Grinding & Polishing, N/C								
Units	37	6	—	3	15	1	1	—
Value	$ 16,628	$ 1,958	—	$ 1,089	$ 8,949	$ 102	$ 440	—
Lathes (incl. N/C)								
Units	4,267	1,143	183	331	37	253	19	147
Value	$ 91,981	$ 28,555	$ 3,079	$ 3,929	$ 2,702	$ 8,688	$ 1,318	$ 2,566
Lathes, N/C								
Units	299	78	9	12	5	26	2	5
Value	$ 32,332	$ 9,670	$ 1,269	$ 1,498	$ 859	$ 3,295	$ 432	$ 485
Milling (incl. N/C)								
Units	1,137	243	70	52	14	41	18	63
Value	$ 40,635	$ 12,024	$ 1,933	$ 2,367	$ 666	$ 1,359	$ 2,257	$ 823
Milling, N/C								
Units	76	18	1	7	1	6	3	1
Value	$ 11,255	$ 1,843	$ 282	$ 1,299	$ 188	$ 564	$ 1,516	$ 195
Other Metal Cutting								
Units	2,862	652	185	83	57	115	20	323
Value	$ 51,972	$ 16,274	$ 1,432	$ 3,778	$ 1,422	$ 4,179	$ 2,221	$ 1,904
Total Metal Forming								
Units	10,257	1,542	593	550	52	1,237	128	501
Value	$121,965	$ 14,590	$16,518	$ 5,818	$ 3,843	$ 5,011	$ 2,949	$ 2,693

Exchange Rate: 1 Pound = $1.7505.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1983

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	Rep of So. Africa	France	U.S.S.R.	India	Mexico
Grand Total (incl. N/C)								
Units	24,736	3,129	1,554	990	2,153	148	353	96
Value	$289,157	$49,090	$25,105	$20,989	$21,735	$14,508	$12,529	$11,725
Boring (incl. N/C)								
Units	328	64	43	30	14	—	14	—
Value	$ 14,948	$ 3,659	$ 1,494	$ 3,184	$ 115	—	$ 3,070	—
Boring, N/C								
Units	24	6	7	2	—	—	2	—
Value	$ 7,086	$ 1,188	$ 1,094	$ 700	—	—	$ 2,338	—
Drilling (incl, N/C)								
Units	1,114	20	33	33	69	1	8	—
Value	$ 6,022	$ 266	$ 422	$ 496	$ 633	$ 124	$ 250	—
Drilling, N/C								
Units	16	2	1	—	3	1	2	—
Value	$ 1,509	$ 153	$ 46	—	$ 526	$ 124	$ 222	—
Gear Cutting & Finishing (incl. N/C)								
Units	26	6	1	1	4	—	2	—
Value	$ 3,120	$ 597	$ 58	$ 80	$ 346	—	$ 163	—
Gear Cutting & Finishing, NC								
Units	1	—	—	—	—	—	—	—
Value	$ 288	—	—	—	—	—	—	—
Grinding & Polishing (incl. N/C)								
Units	8,602	589	403	185	1,139	69	78	8
Value	$ 50,761	$13,125	$ 3,124	$ 3,311	$ 3,112	$ 5,285	$ 3,015	$ 1,353
Grinding & Polishing, NC								
Units	35	20	1	1	1	—	—	—
Value	$ 8,831	$ 6,184	$ 93	$ 200	$ 294	—	—	—
Lathes (incl. N/C)								
Units	3,453	760	323	45	192	28	16	72
Value	$ 57,897	$11,288	$ 2,761	$ 782	$ 5,335	$ 1,719	$ 1,162	$ 6,442
Lathes, N/C								
Units	229	65	9	3	16	2	5	69
Value	$ 22,889	$ 4,743	$ 828	$ 271	$ 1,805	$ 278	$ 440	$ 6,169
Milling (incl. N/C)								
Units	917	136	36	57	79	1	13	1
Value	$ 22,784	$ 5,768	$ 1,313	$ 1,818	$ 1,719	$ 6	$ 1,235	$ 62
Milling, N/C								
Unit	58	9	12	6	6	—	—	—
Value	$ 3,334	$ 168	$ 880	$ 211	$ 347	—	—	—
Other Metal Cutting								
Units	2,570	770	242	75	91	6	40	—
Value	$ 32,855	$ 6,299	$ 4,829	$ 1,673	$ 5,371	$ 71	$ 889	—
Total Metal Forming								
Units	7,726	784	473	564	565	43	182	15
Value	$100,771	$ 8,088	$11,104	$ 9,649	$ 5,103	$ 7,303	$ 2,746	$ 3,869

Exchange Rate: 1 Pound = $1.517.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1982

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	United States	Japan	Switzerland	Italy
Grand Total (incl. N/C)						
Units	41,231	9,613	3,208	1,714	781	3,774
Value	$404,446	$119,911	$90,794	$55,517	$28,718	$27,734
Boring (incl. N/C)						
Units	410	87	41	16	26	39
Value	$ 25,041	$ 10,750	$ 1,938	$ 1,548	$ 1,869	$ 1,310
Boring, N/C						
Units	72	31	6	13	5	2
Value	$ 17,153	$ 9,573	$ 635	$ 1,391	$ 1,080	$ 658
Drilling (incl. N/C)						
Units	6,000	301	278	77	41	62
Value	$ 10,811	$ 3,504	$ 2,806	$ 160	$ 148	$ 599
Drilling, N/C						
Units	50	11	29	4	—	1
Value	$ 4,408	$ 1,319	$ 2,414	$ 118	—	$ 168
Gear Cutting & Finishing (incl. N/C)						
Units	47	16	9	—	5	2
Value	$ 6,124	$ 1,839	$ 2,348	—	$ 620	$ 105
Gear Cutting & Finishing, N/C						
Units	10	2	7	—	—	—
Value	$ 3,043	$ 345	$ 2,289	—	—	—
Grinding & Polishing (incl. N/C)						
Units	16,661	5,445	728	174	160	889
Value	$ 43,310	$ 11,841	$ 7,927	$ 939	$ 7,058	$ 2,335
Grinding & Polishing, N/C						
Units	40	5	5	4	9	1
Value	$ 6,527	$ 589	$ 1,509	$ 328	$ 1,307	$ 154
Lathes (incl. N/C)						
Units	1,984	393	139	447	92	135
Value	$ 88,036	$ 21,823	$11,619	$26,000	$ 4,307	$ 5,868
Lathes, N/C						
Units	707	96	82	409	13	13
Value	$ 66,566	$ 15,515	$10,198	$25,071	$ 2,187	$ 2,451
Milling (incl. N/C)						
Units	1,151	299	53	60	39	114
Value	$ 38,253	$ 15,542	$ 1,723	$ 1,562	$ 4,000	$ 4,804
Milling, N/C						
Units	131	59	13	25	8	13
Value	$ 19,514	$ 10,178	$ 1,310	$ 884	$ 3,178	$ 1,867
Other Metal Cutting						
Units	6,372	944	694	354	156	1,667
Value	$110,425	$ 24,047	$48,219	$20,685	$ 4,769	$ 4,653
Total Metal Forming						
Units	8,606	2,128	1,266	586	262	866
Value	$ 82,444	$ 30,565	$14,214	$ 4,622	$ 5,947	$ 8,060

Exchange Rate: 1 Pound = $1.7505.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1983

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	Japan	United States	Switzerland	Italy	France	Sweden
Grand Total (incl. N/C)								
Units	55,520	5,276	3,318	3,880	746	3,377	1,919	729
Value	$286,599	$86,560	$53,385	$40,675	$20,597	$19,860	$12,038	$10,677
Boring (incl. N/C)								
Units	353	84	8	15	8	65	48	3
Value	$ 12,414	$ 7,250	$ 540	$ 246	$ 574	$ 1,486	$ 373	$ 125
Boring, N/C								
Units	50	26	6	1	2	3	—	—
Value	$ 8,217	$ 5,862	$ 538	$ 2	$ 453	$ 400	—	—
Drilling (incl, N/C)								
Units	8,363	332	329	504	45	33	187	128
Value	$ 8,582	$ 1,771	$ 268	$ 3,148	$ 494	$ 246	$ 388	$ 466
Drilling, N/C								
Units	104	10	4	35	1	—	2	1
Value	$ 4,131	$ 676	$ 155	$ 2,741	$ 116	—	$ 76	$ 326
Gear Cutting & Finishing (incl. N/C)								
Units	330	7	2	4	1	3	—	—
Value	$ 2,226	$ 964	$ 80	$ 695	$ 27	$ 206	—	—
Gear Cutting & Finishing, NC								
Units	2	—	—	2	—	—	—	—
Value	$ 636	—	—	$ 636	—	—	—	—
Grinding & Polishing (incl. N/C)								
Units	24,928	1,360	1,673	714	162	628	224	316
Value	$ 38,450	$10,849	$ 2,410	$ 5,946	$ 6,036	$ 2,439	$ 493	$ 1,950
Grinding & Polishing, NC								
Units	659	22	—	15	7	1	—	6
Value	$ 10,740	$ 4,344	—	$ 1,918	$ 2,864	$ 91	—	$ 900
Lathes (incl. N/C)								
Units	2,135	202	382	227	85	70	30	27
Value	$ 60,613	$16,900	$20,283	$ 6,078	$ 1,795	$ 3,965	$ 735	$ 2,409
Lathes, N/C								
Units	669	128	319	64	11	25	4	23
Value	$ 49,863	$14,914	$19,780	$ 5,152	$ 641	$ 2,832	$ 209	$ 2,402
Milling (incl. N/C)								
Units	1,022	238	40	20	29	60	81	11
Value	$ 17,916	$ 5,302	$ 1,869	$ 667	$ 1,127	$ 1,806	$ 2,577	$ 48
Milling, N/C								
Unit	69	24	6	6	3	4	15	—
Value	$ 7,300	$ 2,461	$ 1,111	$ 580	$ 718	$ 440	$ 1,600	—
Other Metal Cutting								
Units	8,247	1,001	467	702	97	1,435	844	24
Value	$ 69,966	$20,266	$21,887	$12,936	$ 3,294	$ 4,691	$ 1,759	$ 262
Total Metai Forming								
Units	10,142	2,052	408	1,694	319	1,083	505	220
Value	$ 76,432	$23,258	$ 6,048	$10,959	$ 7,250	$ 5,021	$ 5,713	$ 5,417

Exchange Rate: 1 Pound = $1.517.

Source: The Department of Trade and Industry.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Type of Machine, Units and Value, 1980, 1981 and 1982
(Thousands of U.S. Dollars)

	1980		1981		1982	
Type of Machine	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	16,051	$103,196	14,650	$141,863	12,735	$176,697
Metal Cutting Total	8,592	67,131	9,742	46,647	9,237	91,336
Lathes	709	19,932	501	15,962	353	25,995
Boring Machines	74	867	55	822	66	1,189
Milling Machines	936	3,727	705	1,527	475	3,127
Planing Machines	5	286	23	360	106	21
Broaching Machines	944	1,416	548	525	6	1,350
Drilling Machines	306	2,332	410	1,097	559	3,321
Grinding & Polishing Machines	4,446	15,477	598	6,010	6,039	19,316
Gear Cutting Machines	26	4,856	36	644	22	3,543
Other Metal Cutting	1,152	18,238	6,866	19,701	1,611	33,473
Metal Forming Total	7,459	36,065	4,908	95,216	3,498	85,361
Presses	901	15,723	418	79,003	894	52,054
Forging & Stamping Machines	13	153	43	979	25	6,214
Bending & Rolling Machines	462	4,158	2,319	7,565	360	7,288
Other Metal Forming	6,082	16,031	2,128	7,668	2,219	19,805
TOTAL EXPORTS	61,438	$228,268	70,895	$206,782	58,800	$175,525
Metal Cutting Total	21,485	174,922	23,236	155,313	15,325	124,654
Lathes	3,630	39,3164	3,029	36,703	2,045	28,087
Boring Machines	319	11,289	181	12,878	142	11,008
Milling Machines	7,060	74,294	7,673	62,884	5,274	45,679
Planing Machines	9	109	41	1,021	25	679
Broaching Machines	916	2,783	581	2,502	104	130
Drilling Machines	2,280	11,917	1,744	11,097	2,174	9,038
Grinding & Polishing Machines	2,695	14,279	705	9,660	2,571	14,180
Gear Cutting Machines	16	192	20	290	22	541
Other Metal Cutting	4,560	20,743	9,262	18,276	2,968	15,314
Metal Forming Total	39,953	53,346	47,659	51,469	43,475	50,872
Presses	2,275	20,934	1,905	17,159	1,530	14,841
Forging & Stamping Machines	177	116	224	2,213	92	2,694
Bending & Rolling Machines	35,149	17,842	43,748	19,262	1,828	6,726
Other Metal Forming	2,352	14,454	1,782	12,835	40,025	26,610

Exchange Rate: 1980 $1 = 71.702 Pesetas; 1981 $1 = 92.314 Pesetas; 1982 $1 = 109.52 Pesestas.

Source: Asociación Española de Fabricantes de Máquinas-Herramienta.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Origin and Destination, 1981 to Date (a)
(Thousands of U.S. Dollars)

Country	Imports			Exports		
	1981	1982	1983	1981	1982	1983
GRAND TOTAL	$141,863	$176,697	$86,244	$206,782	$175,525	$99,427
Argentina	—	—	—	3,075	754	79
Australia	—	—	—	4,858	2,093	993
Austria	998	364	—	1,344	1,038	—
Belgium-Luxemburg	3,525	1,236	707	2,409	1,968	2,061
Canada	—	86	—	5,067	2,710	1,269
Chile	—	—	—	2,381	1,002	—
Cuba	—	—	—	3,462	8,811	1,288
East Germany	1,514	—	—	—	—	—
Ecuador	—	—	—	1,579	1,306	1,039
Finland	—	—	—	3,077	4,485	1,493
France	4,498	11,426	23,788	12,276	12,754	7,974
Italy	18,655	21,514	10,388	10,981	5,027	2,617
Japan	6,028	22,666	6,142	—	25	—
Mexico	—	231	—	38,342	32,907	6,677
Morocco	—	—	—	1,899	2,161	1,573
Netherlands	731	892	606	2,643	2,307	1,925
Portugal	—	—	—	8,517	5,624	1,958
South Africa	—	—	—	15,551	6,979	3,334
Sweden	763	1,288	1,034	1,966	2,105	2,151
Switzerland	5,235	5,739	3,188	2,711	1,469	1,335
United Kingdom	5,486	5,068	1,830	7,050	6,884	5,243
U.S.A.	9,535	19,176	2,171	21,501	21,910	8,644
Venezuela	—	—	—	4,885	7,328	3,664
West Germany	82,830	85,627	29,623	22,015	14,229	12,277
All Other	2,006	1,384	6,767	29,190	28,839	31,832

Exchange Rate: 1981 $1 = 92.314 Pesetas; 1982 $1 = 109.52 Pesetas; 1983 $1 = 143.43 Pesetas.

(a) Countries without data are included in "All Other."

Source: Asociación Española de Fabricantes de Máquinas Herramienta.

SPANISH MACHINE TOOL EMPLOYMENT AND CONSUMPTION
(Employment in thousands, values in thousands of U.S. dollars)

Years	Shipments	Imports	Exports	Consumption	Employment
1972	$133,990	$73,194	$43,070	$164,024	12.1
1973	146,112	89,359	40,334	195,137	12.1
1974	206,873	135,009	69,789	272,093	12.2
1975	223,117	168,693	86,532	305,277	11.6
1976	183,600	132,679	90,811	225,468	11.0
1977	190,872	91,373	102,529	179,716	10.5
1978	232,185	90,072	147,579	176,823	10.3
1979	315,829	91,322	210,766	196,385	10.0
1980	352,849	103,196	228,268	227,777	9.5
1981	319,957	142,038	207,038	254,957	8.8
1982	260,226	176,697	175,525	261,398	8.5
1983	188,245	86,244	99,427	175,063	7.6

Source: Asociacion Española de Fabricantes de Maquinas-Herramienta.

FRENCH PRODUCTION OF METAL CUTTING MACHINE TOOLS

By Type of Machine, Units and Value, 1980, 1981 and 1982

(Values in Thousands of U.S. Dollars)

Type of Machine	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
Engine & Turret Lathes, NC	589	$51,454	539	$52,276	474	$48,862
Facing Lathes, NC	2	235	(c)	(c)	(c)	(c)
Vertical Boring & Turning Mills, NC	59	28,904	42	19,727	38	17,182
Turning Centers, NC	42	8,895	76	9,798	105	10,447
Engine Lathes, non-NC	2,406	87,076	(c)	(c)	1,407	25,539
Copying, Multi-tool, & Semi-automatic Turret Lathes, non-NC	319	34,195	163	21,395	101	9,170
Single-Spindle Automatic Lathes, non-NC	424	22,233	182	8,542	93	4,712
Other Lathes, non-NC	239	21,867	97	5,777	76	4,242
Comb. Boring & Milling Machines, NC	57	38,401	12	9,265	12	6,730
Comb. Boring & Milling Machines, non-NC	14	6,094	(c)	(c)	(c)	(c)
Boring Machines, NC	5	2,934	(c)	(c)	(c)	(c)
Boring Machines, non-NC	26	2,124	41	1,980	28	837
Milling Machines, NC	231	19,472	309	74,132	251	56,551
Knee-Type Milling Machines, non-NC	1,967	59,956	1,660	43,799	1,359	35,630
Bed-Type Milling Machines, non-NC	584	42,811	317	22,105	246	12,825
Other Milling Machines, non-NC	190	64,922	66	4,491	70	2,801
Drilling Machines, NC	6	471	(c)	(c)	(c)	(c)
Comb. Drilling & Boring Machines, NC	17	1,372	(c)	(c)	(c)	(c)
Radial Drilling Machines, non-NC	171	1,568	203	1,785	132	1,370
Bench Type Drilling Machines, non-NC	4,440	4,792	3,442	2,655	2,883	2,331
Pillar Type Drilling Machines, non-NC	2,710	5,087	2,269	3,868	1,702	3,148
Column Type Drilling Machines, non-NC	125	6,029	127	5,353	57	2,416
Grinding Machines, NC	42	7,959	14	1,333	(c)	(c)
Universal Tool & Cutter Grinding Machines, non-NC	234	3,295	58	435	(c)	(c)
Single Point Cutting Tool Sharpening Macnines, non-NC	178	195	(c)	(c)	(c)	(c)
Cutter Sharpening Machines, non-NC	1,159	3,296	(c)	(c)	1,003	1,115
Other Tool & Cutter Grinding Machines, non-NC			243	4,119	285	4,063
Universal Cylindrical Grinding Machines, non-NC	49	2,314	37	1,583	45	2,062
Internal Cylindrical Grinding Machines, non-NC	125	11,642	38	1,028		
External Cylindrical Grinding Machines, non-NC			109	9,930	69	6,531
Surface Grinding Machines, non-NC	528	10,262	355	6,368	250	3,568
Other Grinding Machines, non-NC	185	30,736	179	22,877	80	5,714
Screw Cutting Machines, non-NC	103	5,103	74	3,089	(c)	(c)
Tapping Machines, non-NC	(a)	(a)	(c)	(c)	(c)	(c)
Planing Machines, non-NC	(a)	(a)	(c)	(c)	—	—
Slotting & Shaping Machines, non-NC	110	734	65	616	61	412
Surfacing Machines, non-NC	12,857	2,891	7,892	1,941	5,852	1,198
Polishing, Honing, & Lapping Machines, non-NC	1.387	3,016	1,030	1,675	895	4,085
Broaching Machines, non-NC	(a)	(a)	—	—	—	—
Gear Cutting Machines, non-NC	(a)	(a)	(c)	(c)	(c)	(c)
Sawing & Cut-Off Machines, non-NC	(b)	(b)	1,267	6,098	1,248	4,333
Band Sawing Machines, non-NC	430	4,216	330	2,878	322	2,849
Other Sawing or Cut-Off Machines, non-NC	3,490	10,081	1,939	4,356	1,960	4,048
Spark Erosion Machines, non-NC	(a)	(a)	—	—	(c)	(c)
Transfer Lines	(a)	(a)	219	99,135	201	71,223
Unit Heads	(a)	(a)	506	1,569	228	776
Machining Centers	61	19,367	119	27,605	123	28,503
Other Metal Cutting Machines, NC	6	2,830	14	3,759	45	18,761
Other Metal Cutting Machines, non-NC	1,525	162,467	11,976	68,247	11,098	54,064
Total Metal Cutting, NC	1,120	182,294	1,145	200,130	1,100	187,626
TOTAL METAL CUTTING	37,092	791,296	NA	NA	NA	NA

Exchange Rate: 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs.

(a) Included in "Other Metal Cutting Machines, non-NC."
(b) Included in "Other Sawing or Cut-Off Machines, non-NC."
(c) Data withheld.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION OF METAL FORMING MACHINE TOOLS
By Type of Machine, Units and Value, 1980, 1981 and 1982
(Values in Thousands of U.S. Dollars)

Type of Machine	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
Sheet Metal Bending Machines, non-NC	316	$ 3,497	264	$ 2,630	224	$ 2,003
Sheet Metal Folding Machines, non-NC	685	2,376	1,047	4,545	1,137	2,145
Sheet Metal Straightening Machines, non-NC	392	3,339	(c)	(c)	43	3,342
Bar & Tube Drawing Machines, non-NC	18	3,947	18	4,230	(c)	(c)
Straightening Machines, non-NC			2	316	(c)	(c)
Profiling, Flanging, & Molding Machines, non-NC	63	3,895	81	3,756	86	2,080
Other Bending Machines, non-NC	4,561	3,961	2,941	1,850	602	2,008
Punching, Shearing, & Comb. Punching & Shearing Machines, NC	11	2,366	(c)	(c)	(c)	(c)
Mechanical Shearing Machines, non-NC	199	2,554	466	2,156	249	1,180
Hydraulic Shearing Machines, non-NC	607	17,540	555	12,893	677	12,225
Other Shearing Machines, non-NC	2,034	2,136	1,989	1,507	1,754	2,796
Punching Machines, non-NC	123	2,282	342	1,289	262	907
Comb. Punching & Shearing Machines, non-NC	338	7,049	184	1,389	(c)	(c)
Wireworking Machines, non-NC	133	3,232	(c)	(c)	(c)	(c)
Presses, NC	99	4,305	(c)	(c)	(c)	(c)
Open Front Mechanical Presses, non-NC:						
Less than 10 tonnes	18	98	22	145	44	227
10-16 tonnes	77	906	55	389		
16-25 tonnes	56	1,658	35	512	30	246
25-40 tonnes	59	1,300	35	699	26	438
40-63 tonnes	15	633	11	282	11	236
63-80 tonnes	21	943	10	305	7	196
80-100 tonnes	19	945	12	428	5	155
100-125 tonnes	12	642	7	332	—	—
125+ tonnes	17	2,737	32	1,140	10	480
Single or Double Action, non-NC	40	9,796	42	9,197	(c)	(c)
Forging, Stamping, & Percussion Presses, non-NC	12	15,148	15	6,576	(c)	(c)
Presses w/ Automatic Feed, non-NC	75	10,167	(c)	(c)	(c)	(c)
Mechanical Press Brakes, non-NC	(a)	(a)	(c)	(c)	(c)	(c)
Hydraulic Press Brakes, non-NC	1,107	28,598	731	17,122	696	13,716
Drop & Air Hammers, non-NC	(a)	(a)	—	—	—	—
Open Front Hydraulic Presses, non-NC	342	5,984	233	4,060	80	1,493
Other Hydraulic Presses, non-NC	200	31,642	163	25,010	211	15,590
Other Metal Forming Machines, NC	8	284	17	1,267	31	833
Other Metal Forming Machines, non-NC	1,234	30,045	11,598	27,248	14,481	18,997
Total Metal Forming, NC	118	6,955	93	8,305	146	4,799
TOTAL METAL FORMING	12,891	204,005	NA	NA	NA	NA

Exchange Rate: 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs.

(a) Included in "Other Metal Cutting Machines, non-NC."

(b) Included in "Other Sawing or Cut-Off Machines, non-NC."

(c) Data withheld.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION AND EXPORTS OF N/C MACHINES (a)

Units and Value, 1968 to Date

(Values in Millions of U.S. Dollars)

Year	Production		Exports	
	Units	Value	Units	Value
1968	154	$ 12.2	46	NA
1969	154	12.7	64	NA
1970	147	11.0	46	$ 3.9
1971	247	25.0	83	10.5
1972	230	27.8	61	5.6
1973	389	42.7	141	12.6
1974	535	51.0	261	22.3
1975	612	75.5	217	23.7
1976	576	80.4	165	26.6
1977	579	97.6	223	52.7
1978	867	163.3	391	104.0
1979	1,068	196.1	417	94.5
1980	1,238	189.2	370	85.2
1981	1,238	208.4	NA	NA
1982	1,246	199.5	NA	NA

NA - Not Available.

(a) The survey covered metalworking and woodworking manufacturers.

Source: Syndicat des Constructeurs Français de Machines-Outils; Survey of 300 enterprises.

FRENCH MACHINE TOOL INDUSTRY

Selected Data, 1979 to Date

(Values in Millions of U.S. Dollars)

	1979	1980	1981	1982	1983
Employment	20,158	19,650	18,984	17,661	15,502
Production Workers	12,033	11,597	11,156	10,265	8,982
Others	8,125	8,053	7,818	7,396	6,520
Average Weekly Hours	40.5	40.7	40.2	38.6	37.8
Compensation	$282.1	$ 314.9	$271.3	$237.2	$197.0
Wages	135.2	150.5	131.3	112.2	90.1
Salaries	146.9	164.4	140.0	125.0	106.8
Orders(a)	$921.9	$1,015.4	$722.4	$587.7	$489.9
Domestic	585.6	680.3	438.2	410.8	320.1
Foreign	336.3	335.1	284.2	176.9	169.8
Shipments(a)	$877.1	$ 954.0	$809.5	$622.1	$560.1

Exchange Rates: 1979 $1 = 4.254 Francs; 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs.

(a) Excluding Tax.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH EXPORTS OF MACHINE TOOLS
By Destination, Units and Value, 1981 to Date
(Values in Thousands of U.S. Dollars)

Destination	1981		1982		1983	
	Units	Value	Units	Value	Units	Value
TOTAL	NA	$390,482	NA	$295,038	NA	$295,240
WESTERN EUROPE						
Austria	10,078	2,195	570	2,572	310	1,987
Belgium-Luxembourg	3,851	12,628	4,521	11,826	4,066	7,284
Finland	756	2,098	373	2,772	306	2,257
Greece	NA	NA	283	5,495	311	1,333
Italy	9,148	16,939	3,533	12,937	4,143	14,213
Netherlands	1,529	3,542	1,399	3,295	1,939	1,804
Portugal	657	12,989	757	22,552	328	1,271
Spain	1,708	9,670	1,408	14,619	1,444	20,557
Sweden	1,116	5,697	972	2,421	855	3,693
Switzerland	3,450	16,867	3,984	12,468	2,059	8,714
Turkey	87	7,329	89	5,200	83	3,387
United Kingdom	8,592	19,803	3,840	16,363	3,212	14,932
West Germany	14,808	39,696	15,256	29,776	13,193	22,282
EASTERN EUROPE						
Czechoslovakia	11	992	23	2,460	NA	NA
East Germany	708	34,220	58	7,025	50	1,107
Rumania	62	2,715	NA	NA	10	4,272
U.S.S.R.	353	30,454	239	20,841	265	13,940
Yugoslavia	187	3,845	325	11,343	651	3,975
NORTH AND CENTRAL AMERICA						
Canada	874	7,424	492	1,345	1,039	3,421
Mexico	1,440	17,681	140	9,352	196	69,947
United States	4,707	31,104	3,593	11,024	2,372	17,082
SOUTH AMERICA						
Argentina	209	4,762	50	2,676	NA	NA
Venezuela	NA	NA	324	1,340	NA	NA
ASIA						
India	53	3,262	29	1,372	52	1,689
Iraq	972	4,156	672	6,994	110	2,427
Israel	220	2,734	296	1,569	331	2,508
Japan	710	1,316	510	915	529	1,213
People's Rep. of China	14	1,888	27	1,051	29	784
Saudi Arabia	698	7,196	1,099	3,241	1,735	2,056
Singapore	NA	NA	329	4,394	NA	NA
OCEANIA						
Australia	1,023	2,863	622	2,146	617	1,003
AFRICA						
Algeria	23,049	10,209	2,339	9,547	3,594	16,096
Egypt	145	9,844	222	4,514	865	3,410
Rep.of S. Africa	3,331	5,169	672	2,421	1,881	6,566
Tunisia	2,614	5,076	940	4,689	1,632	3,984
Franc Area(a)	3,162	8,050	2,717	7,124	3,095	7,794
OTHER	NA	46,070	NA	35,359	NA	28,252

NA - Not available; exports, if any, are included in "Other".

Exchange Rate: 1981, $1 = 5.4346; 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs.

(a) Franc Area — 1981: Cameroon, Congo, Madagascar & Senegal; 1982: Cameroon, Congo, Gabon & Ivory Coast; 1983: same as 1982 but also including Madagascar & Senegal.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH IMPORTS OF MACHINE TOOLS

By Origin, Units and Value, 1981 to Date

(Values in Thousands of U.S. Dollars)

Destination	1981 Units	1981 Value	1982 Units	1982 Value	1983 Units	1983 Value
TOTAL	271,801	$566,550	257,060	$479,278	194.456	$351,056
WESTERN EUROPE						
Austria	1,598	4,427	1,911	5,145	1,365	3,788
Belgium-Luxembourg	1,047	13,670	655	12,244	871	7,538
Denmark	2,866	770	2,878	1,069	2,236	1,376
Finland	18	210	59	182	118	245
Italy	19,175	124,486	13,478	98,904	9,990	60,176
Netherlands	17,009	4,853	14,332	4,782	8,070	2,997
Norway	24	338	13	419	8	120
Portugal	13	25	25	183	30	111
Spain	925	12,254	923	13,006	1,108	5,598
Sweden	655	8,851	1,357	4,552	1,434	5,510
Switzerland	4,430	57,486	2,168	50,721	2,994	47,384
United Kingdom	3,685	24,663	6,276	19,093	5,085	15,948
West Germany	36,970	194,311	29,114	156,968	19,875	119,618
EASTERN EUROPE						
Bulgaria	387	1,334	200	813	144	650
Czechoslovakia	147	2,663	123	3,011	77	1,806
East Germany	333	3,981	2,425	6,272	2,252	3,218
Hungary	17	551	23	1,638	2	232
Poland	1,208	1,639	2,687	972	1,810	1,662
Rumania	58	669	120	398	1,625	1,059
U.S.S.R.	774	1,758	289	1,921	266	2,061
Yugoslavia	22	149	54	279	25	149
NORTH AND CENTRAL AMERICA						
Canada	35	935	24	691	26	387
United States	1,822	41,579	4,261	35,971	1,172	17,918
ASIA						
India	7	151	20	302	6	35
Japan	4,734	48,179	2,813	45,728	2,703	36,320
Taiwan	172,095	9,680	169,421	6,818	130,177	5,045
OCEANIA						
Australia	NA	NA	1	96	1	2
OTHER	1,747	6,938	1,410	7,100	986	4,103

NA - Not available; imports, if any, are included in "Other."

Exchange Rate: 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH FOREIGN TRADE IN MACHINE TOOLS
By Type of Machine, Units and Value, 1981 to Date
(Values in Thousands of U.S. Dollars)

Type of Machine	1981 Units	1981 Value	1982 Units	1982 Value	1983 Units	1983 Value
TOTAL IMPORTS	271,801	$566,550	257,060	$479,278	194,456	$351,056
Metal Cutting Total (including N/C)	253,702	441,561	246,636	348,125	183,410	252,683
Boring Machines (including N/C)	1,168	38,307	280	25,786	204	14,663
Boring Machines, N/C	125	21,883	91	15,783	51	9,364
Drilling Machines (including N/C)	49,651	43,280	47,248	34,100	42,539	23,832
Drilling Machines, N/C	227	29,309	164	17,939	120	11,031
Gear Cutting	179	19,214	119	7,792	113	7,368
Grinding & Polishing	190,258	73,274	185,138	64,848	130,304	48,906
Lathes (including N/C)	4,269	102,872	3,908	82,848	3,176	64,417
Lathes, N/C	768	55,027	888	48,442	653	41,115
Milling Machines (including N/C)	1,829	62,865	1,581	48,482	1,431	37,417
Milling Machines, N/C	319	34,718	249	23,602	302	21,808
Other Metal Cutting	6,348	101,749	8,362	84,269	5,643	56,079
Metal Forming Total	18,099	124,989	10,424	131,153	11,046	98,374
Hydraulic Presses, non-NC	392	7,290	494	6,370	353	5,751
Mechanical Presses, non-NC	5,928	28,325	1,123	23,897	1,249	20,271
Presses, N/C	56	815	45	2,004	51	3,312
Forging Machines	101	5,922	96	7,643	62	2,999
Punching, Shearing, Bending and Forming Machines	5,974	43,922	5,307	49,907	5,928	37,358
Wire Drawing Machines	265	9,902	195	7,107	186	7,925
Other Metal Forming	5,383	28,814	3,164	33,867	3,217	20,757
TOTAL EXPORTS	119,582	$390,482	66,189	$195,038	64,004	$295,240
Metal Cutting Total (including N/C)	89,916	255,137	50,238	183,365	50,205	207,173
Boring Machines (including N/C)	19,348	13,461	242	9,365	231	3,601
Boring Machines, N/C	85	3,910	38	2,831	68	890
Drilling Machines (including N/C)	21,257	12,382	9,179	9,803	12,494	15,277
Drilling Machines, N/C	42	1,902	273	2,528	371	6,115
Gear Cutting	80	1,807	89	1,101	90	4,113
Grinding & Polishing	14,977	48,959	10,613	38,743	12,044	79,809
Lathes (including N/C)	2,377	68,108	2,018	47,319	1,176	40,702
Lathes, N/C	327	26,110	221	19,558	235	20,901
Milling Machines(including N/C)	2,532	65,691	2,421	41,416	2,560	36,030
Milling Machines, N/C	180	27,570	138	18,401	152	17,543
Other Metal Cutting	29,345	44,730	25,676	35,619	21,610	27,641
Metal Forming Total	29,666	135,345	15,951	111,673	13,799	88,068
Hydraulic Presses, non-NC	432	8,479	343	3,887	317	4,110
Mechanical Presses, non-NC	6,064	22,111	2,304	24,455	983	13,190
Presses, N/C	36	1,698	1	6	26	1,229
Forging Machines	406	972	358	3,671	1,164	2,509
Punching, Shearing, Bending and Forming Machines	9,468	41,891	6,234	36,429	4,600	29,197
Wire Drawing Machines	1,698	17,529	189	7,151	112	3,200
Other Metal Forming	11,562	42,665	6,522	36,074	6,597	34,632

Exchange Rate: 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs.

Source: Syndicat des Constructeurs Français de Machine-Outils.

ITALIAN IMPORTS AND EXPORTS OF MACHINE TOOLS
By Origin and Destination, 1981 to Date
(Thousands of U.S. Dollars)

	Imports			Exports		
	1981	1982	1983	1981	1982	1983
TOTAL	$300,342	$208,595	$181,788	$795,222	$639,884	$603,437
Austria	2,563	2,553	1,514	8,653	6,973	8,362
Belgium-Luxemborg	3,111	3,458	2,304	9,289	8,587	11,061
Brazil	(a)	(a)	(a)	12,810	7,406	8,757
Canada	(a)	2,021	(a)	16,784	9,280	(a)
Czechoslovakia	7,516	2,278	2,107	(a)	(a)	(a)
East Germany	12,615	7,198	3,160	15,204	(a)	(a)
France	16,674	12,294	15,012	116,632	89,453	92,771
Japan	11,807	5,687	7,374	(a)	4,745	(a)
Mexico	(a)	(a)	(a)	33,775	13,262	12,312
Netherlands	5,132	1,417	922	9,146	6,424	(a)
Poland	4,368	1,407	(a)	21,763	(a)	(a)
Rumania	2,784	(a)	(a)	12,776	(a)	9,086
Saudi Arabia	(a)	(a)	(a)	12,474	13,343	15,209
South Africa	(a)	(a)	(a)	39,074	19,281	14,946
Spain	11,760	6,115	2,963	19,861	19,672	10,732
Sweden	4,285	7,170	4,411	13,493	13,982	9,284
Switzerland	47,878	38,313	43,390	28,179	20,342	14,156
Turkey	(a)	(a)	(a)	17,383	10,529	24,361
United Kingdom	15,526	8,047	6,782	31,094	32,847	18,765
United States	19,190	20,030	15,275	46,205	42,572	39,110
U.S.S.R.	8,828	3,690	4,214	43,586	64,422	64,590
Venezuela	(a)	(a)	(a)	12,803	12,344	(a)
West Germany	112,866	79,934	65,644	96,445	60,725	58,006
Yugoslavia	2,205	782	(a)	13,777	11,761	10,403
All Other	11,234	6,201	6,716	164,017	171,934	181,526

(a) Imports and exports, if any, are included in "All Other."

Note: Individual items may not add to totals due to rounding.

Exchange Rate: 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.8 Lire.

Source: Unione Costruttori Italiana Macchine Utensili.

ITALIAN EXPORTS OF MACHINE TOOLS
1980 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1980	1981	1982	1983
TOTAL	$847,629	$795,222	$639,884	$603,437
Lathes	129,851	102,730	78,740	81,634
Boring Machines	75,514	73,498	54,687	48,082
Milling Machines	83,238	78,543	57,389	54,592
Drilling Machines	56,613	52,852	38,447	45,335
Broaching Machines	6,366	6,725	3,431	7,328
Grinding Machines	77,236	67,698	45,450	52,388
Other Abrasive Machines	34,783	43,474	32,677	30,227
Gear Cutting Machines	3,290	2,790	3,026	3,737
Shaping-Sawing-Cutting off-Slotting Machines	32,283	33,762	23,878	22,349
Presses	66,168	67,108	47,326	44,250
Shears and Punching Machines	25,260	20,954	27,351	23,688
Bending Machines	45,027	36,731	34,367	31,474
Forging Machines	3,472	2,870	3,839	5,213
All Others	208,528	205,487	189,276	153,140

Exchange rates: 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.5 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiana Macchine Utensili.

ITALIAN IMPORTS OF MACHINE TOOLS
1980 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1980	1981	1982	1983
TOTAL	$356,366	$300,342	$208,595	$181,788
Lathes	80,891	61,736	34,265	25,959
Boring Machines	17,711	14,780	11,326	16,522
Milling Machines	40,820	36,650	22,828	10,927
Drilling Machines	11,146	12,738	7,016	6,023
Grinding Machines	31,793	26,538	23,757	25,645
Other Abrasive Machines	21,013	17,435	11,056	10,546
Gear Cutting Machines	9,476	9,222	5,602	4,026
Shaping-Sawing-Cutting off-Slotting Machines	12,395	11,161	7,903	5,698
Presses	32,044	23,638	18,[illegible]02	13,434
Shears and Punching Machines	9,031	10,335	6,816	5,637
Bending Machines	10,579	11,696	7,531	5,094
Forging Machines	5,782	5,315	2,490	4,431
All Others	73,685	59,096	49,103	47,846

Exchange rates: 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.8 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiana Macchine Utensili.

ITALIAN PRODUCTION, IMPORTS AND EXPORTS OF MACHINE TOOLS

By Weight and Value, 1969 to Date

(Weights in Thousands of Metric Tonnes and Values in Millions of U.S. Dollars)

	Shipments		Imports		Exports	
Year	Weight	Value	Weight	Value	Weight	Value
1969	148.0	$ 332.8	42.2	$103.9	71.4	$171.7
1970	188.0	480.0	45.3	123.8	58.9	190.8
1971	186.0	516.2	45.9	159.9	61.8	186.0
1972	170.0	523.0	47.8	134.8	62.5	206.6
1973	162.0	620.9	55.6	187.0	57.2	236.4
1974	205.0	891.8	66.6	261.5	76.1	322.5
1975	160.0	842.5	45.0	212.9	75.7	432.1
1976	140.0	750.9	38.3	160.5	67.0	359.0
1977	146.5	878.3	39.6	192.9	76.5	442.4
1978	150.0	1,060.5	33.8	195.0	89.0	596.3
1979	160.0	1,354.0	36.7	255.9	91.4	689.0
1980	222.7	1,728.1	48.8	356.4	95.0	847.6
1981	NA	1,539.4	44.0	300.3	86.3	795.2
1982	NA	1,138.6	25.6	208.6	70.9	639.9
1983	NA	1,047.9	NA	181.8	NA	603.4

Exchange Rate: 1975 $1 = 552.85 Lire; 1976 $1 = 832.29 Lire; 1977 $1 = 882.39 Lire; 1978 $1 = 848.66 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.8 Lire.

Source: Unione Costruttori Italiani Macchine Utensili.

SWEDISH PRODUCTION, IMPORTS, AND EXPORTS OF MACHINE TOOLS

Cutting & Forming, By Type of Machine, 1982 and 1983

(Thousands of U.S. Dollars)

	Production		Imports		Exports	
Machine Classification	1982 (r)	1983 (E)	1982	1983	1982	1983
GRAND TOTAL	$223,005	$206,597	$190,789	$169,168	$176,844	$161,296
Total Metal Cutting	97,456	96,516	114,989	91,196	71,587	59,439
Drilling Machines	7,767	8,217	5,249	3,223	7,521	5,112
Gear Cutting Machines	—	—	1,151	1,307	258	393
Grinding and Polishing	40,946	43,041	18,334	15,578	29,604	31,314
Lathes	26,158	24,912	30,304	22,195	20,499	13,431
Milling Machines	20,472	18,260	26,087	19,752	10,364	6,364
Broaching Machines	—	—	4,381	344	39	29
Planers and Shapers	16	130	26	17	245	63
Other Metal Cutting Machines	2,096	1,956	29,456	28,779	3,057	2,735
Total Metal Forming	67,555	60,127	36,239	38,382	66,879	55,035
Hammers	985	783	296	760	1,424	441
Presses inc. Forging Presses	21,654	18,260	8,421	5,165	31,110	21,211
Punching and Shearing Machines	7,992	11,086	12,090	13,994	7,917	10,715
Other Metal Forming Machines	36,923	29,998	15,432	18,463	26,427	22,669
Parts and Accessories	57,994	49,954	39,561	39,590	38,378	46,822

E - Estimate. r - Revised.

Exchange Rate: 1982 $1 = 6.2826 Kronor; 1983 $1 = 7.6671 Kronor.

Source: The Swedish Machine Tool Manufacturers' Association.

SWEDISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Country, 1981 to Date
(Thousands of U.S. Dollars)

Country	Imports 1981	Imports 1982	Imports 1983	Exports 1981	Exports 1982	Exports 1983
TOTAL	$191,554	$151,228	$129,578	$164,321	$138,465	$114,474
Europe	144,961	122,126	105,173	91,535	83,522	79,899
Austria	1,249	(a)	1,048	2,082	(a)	2,591
Belgium	2,239	(a)	1,017	1,448	(a)	810
Denmark	5,101	4,572	3,963	7,854	7,831	5,593
Finland	2,845	2,356	1,679	11,721	10,153	8,965
France	6,032	2,240	3,366	9,101	4,896	5,725
Italy	13,981	19,305	9,561	5,046	7,060	4,881
Netherlands	2,165	(a)	1,915	2,163	(a)	2,838
Norway	427	(a)	299	9,486	7,797	7,278
Portugal	35	(a)	--	655	(a)	346
Spain	2,251	2,604	2,214	869	833	910
Switzerland	14,921	10,898	9,005	1,936	2,157	1,666
United Kingdom	10,615	8,501	12,794	10,248	9436	10,379
West Germany	74,659	57,897	53,895	16,743	12,421	12,373
East European Bloc	8,271	NA	4,372	10,359	NA	12,588
Czechslovakia	3,803	2,674	1,950	398	(a)	444
U.S.S.R.	1,097	3,064	395	4,598	9,432	10,563
Other East Bloc(b)	3,371	(a)	2,027	5,363	(a)	1,581
All Other Europe	171	8,014	45	1,824	11.507	2,957
United States	13,920	9,466	4,760	29,400	27,385	14,093
Canada	95	414	872	4,287	2,915	1,293
South & Central America	31	1	—	14,887	2,758	1,810
Japan	29,746	17,277	17,202	3,804	5,782	2,506
All Other Asia	2,800	1,920	1,571	12,452	11,715	12,233
Africa	—	21	—	6,838	3,087	1,798
Australia, New Zealand, West Samoa	—	4	—	1,118	1,299	814

NA - Not Avaiable.

Exchange Rate: 1981 $1 = 5.0634 Kronor; 1982 $1 = 6.2826 Kronor; 1962 $1 = 7.6671 Kronor.

(a) Included in "All Other Europe."
(b) Includes Bulgaria, GDR, Hungary, Poland and Romania.

Note: Individual items may not add to totals due to rounding.

Source: The Swedish Machine Tool Manufacturers' Association.

NUMBER OF COMPANIES AND EMPLOYEES IN THE SWEDISH MACHINE TOOL INDUSTRY

	1979	1980	1981	1982	1983	Forecast 1984
Number of Companies	40	40	38	36	35	35
Number of Employees	4,100	4,000	3,700	3,100	3,000	3,000

Source: The Swedish Machine Tool Manufacturers' Association.

SWISS EXPORTS AND IMPORTS OF MACHINE TOOLS
1981 to Date
(Thousands of U.S. Dollars)

	Exports			Imports		
	1981	1982	1983	1981	1982	1983
GRAND TOTAL	$740,324	$713,962	$670,890	$188,809	$157,674	$116,289
Argentina	4,264	3,597	661	—	—	—
Australia	3,110	3,866	2,818	—	15	—
Austria	17,466	13,677	11,403	3,037	2,199	1,826
Belgium-Luxembourg	7,294	6,425	5,715	481	762	939
Brazil	7,578	6,388	3,055	—	216	1
Bulgaria	10,189	10,859	24,275	271	35	109
Canada	5,456	7,495	2,906	11	12	14
People's Rep. of China	19,658	30,584	23,779	—	18	2
Czechoslovakia	6,113	10,412	11,712	1,428	1,264	570
Denmark	3,504	3,358	2,940	1,870	1,305	616
East Germany	9,460	9,114	5,652	705	522	535
Finland	5,035	5,912	2,825	244	184	97
France	54,708	49,468	45,435	15.002	11,254	6,852
Hungary	6,836	3,340	3,932	157	472	394
India	20,471	14,323	15,020	87	119	3
Indonesia	1,073	4,811	1,926	—	—	—
Iraq	2,445	22,315	21,639	—	—	—
Israel	3,147	3,371	4,116	—	—	—
Italy	48,750	37,833	44,216	24,653	20,969	13,083
Japan	43,965	33,290	34,323	19,984	13,795	11,845
Mexico	8,506	5,378	1,560	—	—	—
Netherlands	10,600	8,585	9,566	2,802	2,370	1,453
Pakistan	723	916	1,606	—	—	—
Poland	14,769	6,016	8,110	995	207	45
South Africa	13,934	15,345	11,667	—	—	20
Spain	6,037	4,930	5,174	3,082	1,670	1,594
Sweden	14,234	10,696	7,870	2,094	2,074	2,073
Taiwan	4,496	5,187	6,625	774	344	510
United Kingdom	39,292	28,634	22,439	10,746	7,430	6,810
United States	79.666	73,039	61,397	7,931	8,816	1,489
U.S.S.R.	50,855	80,190	69,876	462	572	1,181
West Germany	155,513	146,286	142,035	90,817	79,849	63,035
Yugoslavia	13,844	14,512	19,027	103	237	32
All Other	48,056	34,726	35,590	1,073	955	1,161

Exchange Rate: 1981 $1 = 1.9642 Swiss Francs; 1982 $1 = 2.0303 Swiss Francs; 1983 $1 = 2.0991 Swiss Francs.

Note: Individual items may not add to totals due to rounding.

Source: Verein Schweizerischer Maschinen-Industrieller.

NETHERLANDS SALES OF MACHINE TOOLS AND PARTS
By Machine Types, 1978 to Date
(Thousands of U.S. Dollars)

Country	1978	1979	1980	1981	1982(p)	1983(p)
GRAND TOTAL	$54,631	$58,425	$67,854	$63,722	$47,674	$29,326
Metal Cutting Machine Tools	25,374	25,224	29,123	28,334	25,841	12,894
Metal Forming Machine Tools	23,202	26,820	32,594	27,172	17,040	12,158
Hydraulic Presses	4,345	4,038	6,438	11,743	4,045	1,261
Mechanical Presses	3,235	4,287	6,388			
Bending, Forming, Straightening, Cutting & Edging	2,773	2,941	2,364	1,844	4,831	6,061
Other Metal Forming	12,849	15,553	17,404	13,586	8,164	4,835
Metal Cutting Parts & Accessories	1,941	2,692	3,370	8,216	4,794	4,275
Metal Forming Parts & Accessories	4,114	3,689	2,766			

p - Preliminary.

Exchange Rate: 1978 $1 = 2.1636 Guilders; 1979 $1 = 2.006 Guilders; 1980 $1 = 1.9881 Guilders; 1981 $1 = 2.4952 Guilders; 1982 = 2.6702 Guilders; 1983 $1 = 2.8541 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal-Industrieen.

NETHERLANDS IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS
By Type of Machine, 1981 to Date
(Values in Thousands of U.S. Dollars)

Type of Machine	Imports			Exports		
	1981	1982	1983	1981	1982	1983
TOTAL	$168,443	$160,250	$127,010	$107,647	$101,303	$87,839
Lathes	25,008	17,152	14,085	5,130	4,232	4,730
Milling Machines	23,325	28,650	21,128	15,109	14,381	8,619
Grinding, Honing and Polishing Machines	16,351	14,868	12,193	15,069	15,130	11,142
Hydraulic Presses	3,887	4,232	1,612	3,847	3,258	4,695
Other Presses	3,286	3,033	2,242	761	899	1,892
Bending, Forming, Straightening, Cutting and Edging Machines	12,424	11,535	14,015	20,920	20,373	21,338
Other Metalworking Machine Tools	29,256	28,013	18,360	13,987	11,422	7,393
Parts and Accessories	54,905	52,768	43,376	32,823	31,608	28,030

Exchange Rates: 1981 $1 = 2.4952 Guilders; 1982 $1 = 2.6702 Guilders; 1983 $1 = 2.8541 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal-Industrieen.

CANADIAN IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Types of Machine, 1981 to Date

(Values in Thousands of U.S. Dollars)

	1981		1982		1983	
Machine Classifications	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	NA	$674,543	NA	$328,685	NA	$270,738
Boring Machinery & Parts	346	54,131	272	25,671	142	15,167
Drilling Machinery & Parts	27,529	14,900	12,263	10,784	17,224	9,559
Grinding Machinery & Parts	125	14,591	53,463	26,546	114,131	22,313
Automatic Lathes	67,612	64,446	410	27,096	583	20,936
Turret Lathes, N.E.C.	866	51,425	2,404	2,041	520	1,724
Lathes & Parts, N.E.C.	859	5,686	861	15,095	938	11,323
Milling Machines & Parts	2,058	28,538	1,039	20,825	1,195	21,574
Shapers, Gear Makers & Parts	3,932	35,836	703	19,074	525	8,018
Transfer Machines & Parts	1,230	50,423	43	26,451	10	18,734
Sawing Machines & Parts	NA	20,455	NA	11,167	NA	10,400
Metalworking Presses & Parts	NA	16,439	915	25,024	889	26,379
Rolls, Bending Machines & Parts	NA	15,662	NA	12,882	NA	7,774
Shearing Machines & Parts	1,866	63,396	234	6,180	175	2,260
Metal Forging Stamping Machines & Parts	475	7,455	88	12,279	97	5,342
Can Making Machinery & Parts	202	107,214	NA	23,789	NA	34,478
Machine Tools & Parts, N.E.C.	NA	123,946	NA	63,782	NA	54,757
TOTAL EXPORTS(a)	NA	$99,772	NA	$154,458	NA	$55,562
Boring, Drilling Machinery & Parts	156	3,740	430	7,653	145	1,522
Grinding Machinery & Parts	128	5,773	91	2,840	240	3,743
Lathes & Parts	268	6,930	157	6,025	312	3,849
Metalworking Presses & Parts	329	10,018	157	5,040	185	7,963
Machine Tools & Parts, N.E.C.	NA	73,311	NA	132,900	NA	38,485

NA - Not Available. N.E.C. - Not Elsewhere Classfied.

(a) Domestic exports; does not include re-exports by Canada.

Exchange rate: 1981 $ 1 = 1.1989 Canadian dollars; 1982 $1 = 1.2337 Canadian dollars; 1983 $1 = 1.2324 Canadian dollars.

Source: Statistics Canada.

ARGENTINE INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1978 and 1979

Selected Product or Industry	Units of Measure	1978	1979
Machine Tools	Mill. U.S. $	60.0	62.0
Metal Cutting Tools	Mill. U.S. $	24.0	24.5
Metal Forming Tools	Mill. U.S. $	36.0	37.5
Petroleum	Thou. cu. Meters	26,251.0	27,435.0
Refrigerators	Thou. Units	128.0	209.0
Automobiles	Units	179,160	252,882
Tractors	Units	5,939	10,610
Televisions	Thou. Units	350.0	390.0
Electric Power	Kw. hrs.	435.8	718.2
Cement	Thou. tons	6,123.2	6,998.4
Pig Iron	Thou. tons	1,819.2	1,942.2
Raw Steel	Thou. tons	2,787.7	3,192.9
Rolled Steel	Thou. tons	2,552.5	2,955.6

Source: La Camara Argentina De La Máquina Herramienta and "American Machinist".

CZECHOSLOVAK PRODUCTION OF MACHINE TOOLS
By Type of Machine, in Units, 1970 to 1975

Type of Machine	1970	1971	1972	1973	1974	1975
GRAND TOTAL	44,342	47,230	44,454	38,852	38,788	38,572
Metal Cutting Total	35,186	39,568	36,910	31,653	30,188	29,660
Boring Machines	582	580	594	572	558	558
Drilling Machines	6,167	5,853	5,024	NA	NA	NA
Grinding Machines	13,581	17,450	15,685	12,333	11,923	11,917
Lathes						
Center Type	5,833	6,141	6,372	6,327	5,941	5,808
Automatic & Semi-Automatic	1,431	1,447	1,530	1,290	1,254	1,226
Milling Machines	2,894	3,149	3,185	2,847	2,627	2,440
Other Metal Cutting	4,698	4,938	4,520	NA	NA	NA
Metal Forming Total	9,156	7,662	7,544	7,199	8,600	8,912
Power Presses	1,356	1,253	1,532	1,763	1,692	1,919
Other Metal Forming	7,800	6,409	6,012	5,436	6,908	6,993

NA - Not Available.

Sources: Czechoslovakia Statistical Abstract - 1971 and Statistical Survey of Czechoslovakia 1977.

CZECHOSLOVAK IMPORTS AND EXPORTS OF MACHINE TOOLS
In Units, for Selected Years, 1965 to Date

	Imports			Exports
Year	Total	Metal Cutting	Metal Forming	Total Machine Tools
1965	4,603	3,915	688	13,572
1967	4,184	3,582	602	15,114
1968	5,770	4,972	798	12,749
1969	6,310	5,607	703	17,411
1970	8,020	6,670	1,350	10,953(a)
1971	9,426	8,350	1,076	13,191
1972	9,589	8,422	1,167	12,108
1973	6,969	6,017	952	10,139(a)
1974	10,624	7,806	2,818	9,689(a)
1975	9,753	7,850	1,903	11,320(a)
1976	8,229	6,789	1,440	11,640(a)
1977	13,445	12,235	1,209	9,535(a)
1978	NA	NA	NA	NA
1979	NA	NA	NA	NA
1980	12,763	11,002	1,761	10,104(a)
1981	7,452	6,534	918	11,260(a)
1982	9,927	8,161	1,766	8,971(a)

NA - Not Available.

(a) Metal Cutting Machines only.

Sources: Facts On Czechoslovak Foreign Trade (annual) and Czechoslovakia Statistical Abstract - 1971.

CZECHOSLOVAK IMPORTS AND EXPORTS OF METALWORKING MACHINERY

By Selected Origin and Destination, 1981 and 1982

(Thousands of U.S. Dollars)

	Imports		Exports	
	1981	1982	1981	1982
TOTAL	$240,300	$217,299	$479,257	$465,912
WESTERN EUROPE				
Austria	1,420	1,741	3,108	1,582
Belgium	1,256	383	2,562	1,773
Denmark	(b)	(b)	1,579	942
France	1,221	3,122	3,809	3,254
Italy	4,935	2,380	11,274	6,481
Netherlands	(b)	(b)	2,474	1,420
Norway	(b)	(b)	1,560	1,524
Spain	100	202	2,880	1,677
Sweden	451	2,040	4,149	2,807
Switzerland	11,814	10,745	6,699	2,658
United Kingdom	1,900	3,802	3,208	991
West Germany	19,000	20,336	15,002	6,340
EASTERN EUROPE				
Bulgaria	9,533	7,175	22,473	20,912
East Germany	50,455	47,346	38,649	30,979
Hungary	15,460	11,830	25,676	31,860
Poland	15,022	12,677	24,570	22,982
Rumania	22,384	21,854	25,023	24,514
U.S.S.R.	51,444	38,451	124,863	161,740
Yugoslavia	9,755	11,629	15,510	15,701
NORTH AND CENTRAL AMERICA				
Canada(a)	(b)	(b)	8,043	2,757
Cuba	(b)	(b)	885	2,101
Mexico	(b)	(b)	8,869	4,885
USA(a)	(b)	(b)	5,510	2,834
SOUTH AMERICA				
Argentina	(b)	(b)	(b)	(b)
Brazil	(b)	(b)	1,175	167
Peru	(b)	(b)	2,692	1,070
Venezuela	(b)	(b)	(b)	(b)
ASIA				
Algeria	(b)	(b)	1,870	3,149
Egypt	(b)	(b)	1,364	2,350
India	(b)	(b)	4,133	5,030
Iran	(b)	(b)	2,826	8,329
Japan	(b)	(b)	4,839	1,093
No. Korea(a)	3,641	2,116	305	345
Syria	(b)	(b)	2,046	1,109
Turkey	(b)	(b)	934	1,968
PACIFIC				
Australia(a)	(b)	(b)	3,029	556
New Zealand(a)	(b)	(b)	1,089	234
ALL OTHER COUNTRIES	21,109	19,471	94,580	87,796

(a) Includes metal cutting only.

(b) Imports or exports, if any, are included in "All other Countries."

Exchange Rate: 1981 $1 = 5.8 Czechoslovak Crowns; 1982 $1 = 6.09 Czechoslovak Crowns.

Source: Facts on Czechoslovak Foreign Trade - 1983.

U.S.S.R. INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1980 to 1982

	Unit of Measure	1980 (r)	1981	1982
MACHINE TOOL INDUSTRY				
Metal Cutting Machines	Thousands	216	205	195
Metal Cutting Machines(a)	Mill. Rubles	1,944	1,955	2,068
Metal Cutting Machines, NC	Units	8,848	10,100	10,600
Presses—Forging Machines	Thousands	57	57	57
Presses—Forging Machines(a)	Mill. Rubles	563	599	612
OTHER SELECTED PRODUCTS AND INDUSTRIES				
Electric Power	Bill. Kwh	1,294	1,326	1,366
Petroleum	Mill. Tons	603	609	613
Gas	Bill. Cu. Meters	435	465	501
Coal Incl. Coking Coal	Mill. Tons	716	704	718
Cast Iron	Mill. Tons	107	108	107
Steel	Mill. Tons	148	148	147
Rolled Ferrous Metal	Mill. Tons	118	118	117
Steel Pipe	Mill. Meters	2,609	2,640	2,591
Steel Pipe	Mill. Tons	18	18	18
Iron Ore	Mill. Tons	245	242	244
Instruments & Automation Equip. with Spare Parts(a)	Mill. Rubles	5,400	4,400	4,800
Computing Equip. with Spare Parts(a)	Mill. Rubles	4,500	2,700	2,900
Automobiles	Thousands	1,327	1,324	1,307

r - Revised.

(a) 1980 data in 1975 wholesale prices; 1981 and 1982 wholesale prices.

Source: U.S.S.R. Central Statistical Administration.

As the exchange rate of the ruble is controlled, value figures are given in rubles.

The official exchange rate: 1980 $1 = .649 rubles; 1981 $1 = .719 rubles; 1982 $1 = .825 rubles.

U.S.S.R. PRODUCTION OF MACHINE TOOLS
Units For Selected Years, 1937 to 1982

Year	Metal Cutting Machine Tools	Forging Machines & Presses	Year	Metal Cutting Machine Tools	Forging Machines & Presses
1937	48,500	3,125	1970	202,300	41,268
1940	58,400	4,668	1971	207,000	42,300
1945	38,400	2,871	1972	211,000	44,000
1950	70,600	7,684	1973	214,000	46,500
1955	117,100	17,117	1974	224,000	48,900
1960	155,900	29,933	1975	231,000	50,500
1961	165,000	30,520	1976	232,000	51,900
1962	176,800	33,434	1977	236,000	54,300
1963	182,700	34,221	1978	236,000	55,400
1964	184,400	34,497	1979	231,000	55,200
1965	186,100	34,637	1980(r)	216,000	57,200
1966	192,200	38,412	1981	205,000	57,100
1967	197,000	41,126	1982	195,000	57,300
1968	200,600	42,128			
1969	205,300	42,658			

r - Revised.

Source: The U.S.S.R. in Figures for 1983—U.S.S.R. Central Statistical Administration.

METAL CUTTING (a) MACHINE TOOL PRODUCTION (c)
U.S. and Selected Communist Countries
For selected years, 1960—1982

	1960	1970	1975	1976	1977	1978	1979	1980 (r)	1981 (r)	1982
United States (b)										
Million US $	$539.30	$1,097.70	$1,790.40	$1,592.20	$1,789.40	$2,139.00	$2,900.00	NA	NA	NA
Thousand units	42.91	49.31	64.32	54.10	59.40	58.12	76.07	61.37	72.01	49.10
Communist Countries										
USSR and Eastern Europe										
USSR										
Million US $	$611.74	$1,427.88	$2,179.78	$2,340.38	$2,556.49	$2,805.78	$2,959.87	NA	NA	NA
Thousand units	155.92	202.16	231.35	232.79	237.56	237.88	230.00	216.0	205.0	195.0
Bulgaria (thousand units)	3.15	13.94	16.28	14.44	13.74	15.32	16.47	18.87	18.67	17.88
Czechoslovakia (thousand units)	30.23	35.19	29.66	31.73	37.61	34.25	35.66	36.90	23.80	25.00
East Germany (thousand units)	41.90	22.22	19.72	19.42	18.76	19.33	18.42	17.50	16.80	16.13
Hungary (thousand units)	9.78	14.48	12.83	14.01	15.27	12.69	12.06	9.80	10.90	12.21
Poland (thousand units)	22.47	29.73	33.19	24.23	23.18	30.00	30.86	28.20	30.50	31.50
Romania (thousand units)	4.44	14.14	28.27	29.95	30.07	27.55	27.19	29.40	36.70	32.04
China (thousand units)	NA	140.00	175.00	NA	200.00	180.00	140.00	134.00	103.00	100.00

NA - Not Available r - Revised.

(a) Power-driven metal cutting machines that are not portable by hand and are used to remove metal in the form of chips; these machines include planers and milling, honing, lapping, grinding, electro-erosion, and ultrasonic cutting machines.

(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1983."

METAL FORMING MACHINE TOOL (a) PRODUCTION (c)
U.S. and U.S.S.R.
For selected years, 1960—1982

	1960	1970	1975	1976	1977	1978	1979	1980	1981(r)	1982
United States										
Million US$	$238.4	$454.1	$ 615.7	$586.0	$651.3	$784.7	$990.3	NA	NA	NA
Thousand units(b)	19.3	24.2	26.8	26.7	32.5	29.5	31.4	30.3	21.7	18.3
USSR										
Million US$	$ 188.3	$359.2	$ 581.1	$664.3	$706.6	$ 776.7	$828.6	NA	NA	NA
Thousand units	29.9	41.3	50.5	51.9	54.3	55.4	56.3	57.2	57.1	57.3

NA - Not Available r - Revised.

(a) Power-driven metal forming machine tools that are not supported in the hands of an operator when in use and are designed to press, forge, emboss, hammer, extrude, blank, spin, shear, and bend metal into shape.

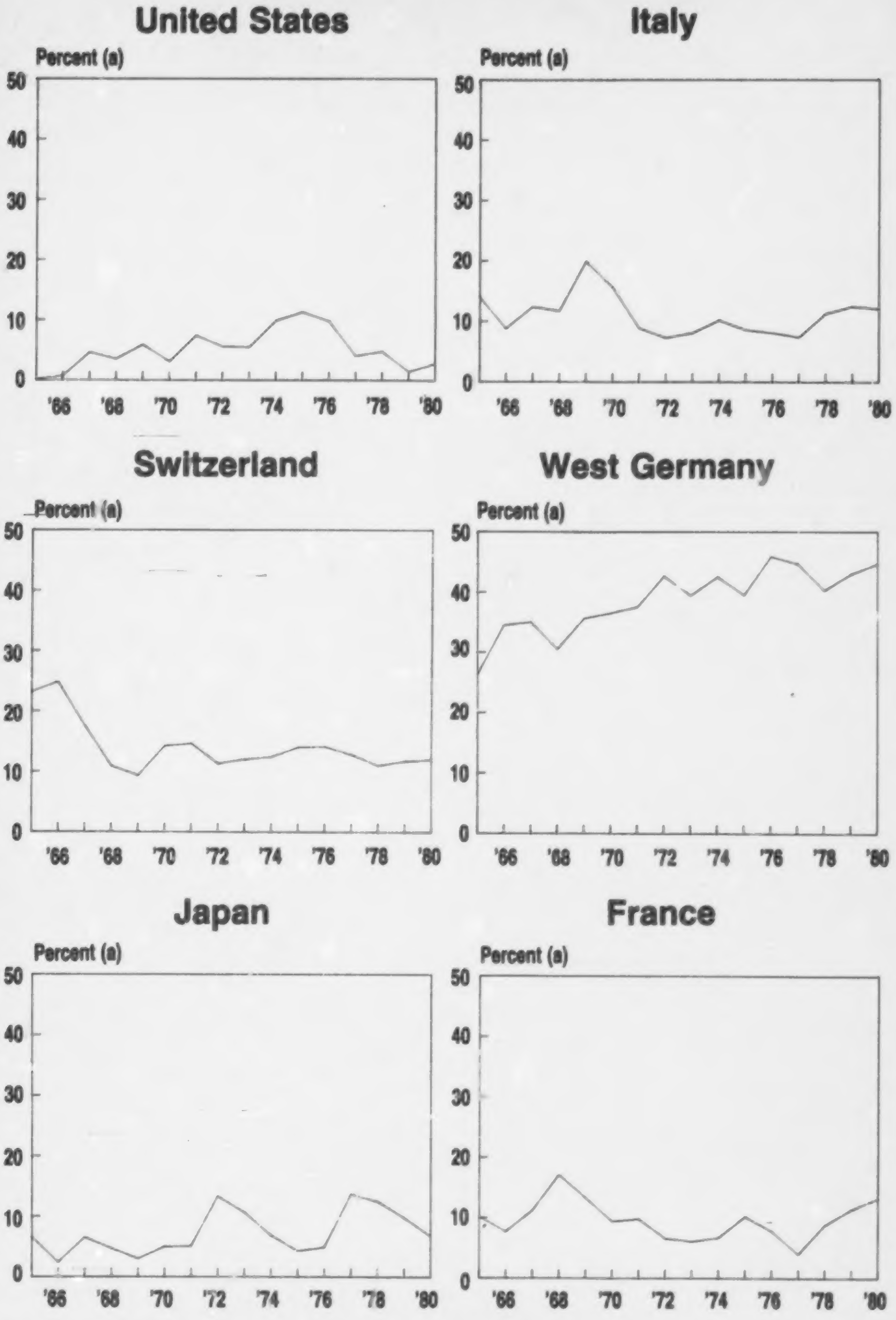
(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1983."

Eastern Bloc Machine Tool Imports

From Six Leading Non-Communist Nations



(a) Percent of total Eastern Bloc imports from non-communist countries.

Source: U.S. Dept. of Commerce.

EASTERN BLOC (a) MACHINE TOOL IMPORTS FROM 14 MAJOR NON-COMMUNIST TRADING NATIONS (b)

Total and Selected Nations, 1962 to Date

(Values in Millions of U.S. Dollars)

Year	Total	United States		France		West Germany(e)		Italy		Japan		Switzerland	
		Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)
1962	$ 47.4	$ .5	1.1%	$ 4.0	8.4%	$ 16.2	34.2%	$ 11.3	23.8%	$ 1.0	2.1%	$ 5.7	12.0%
1963	67.4	.3	.4	6.3	9.3	19.0	28.2	12.9	19.1	2.8	4.2	7.7	11.4
1964	68.7	.2	.3	9.0	13.1	19.4	28.2	12.0	17.5	3.1	4.5	10.9	15.9
1965	60.9	.1	.2	6.2	10.2	16.0	26.3	8.5	14.0	4.0	6.6	14.1	23.2
1966	71.3	.5	.7	5.5	7.7	24.6	34.5	6.3	8.8	1.7	2.4	17.7	24.8
1967	93.6	4.3	4.6	10.5	11.2	32.8	35.0	11.6	12.4	6.1	6.5	16.5	17.6
1968	162.7	5.7	3.5	27.9	17.1	49.6	30.5	19.1	11.7	7.6	4.7	17.8	10.9
1969	307.3	18.1	5.9	40.9	13.3	109.3	35.6	61.1	19.9	9.3	3.0	28.7	9.3
1970	257.9	8.0	3.1	24.2	9.4	94.2	36.5	40.3	15.6	12.8	5.0	36.5	14.2
1971	201.2	14.8	7.4	19.8	9.8	75.5	37.5	18.0	8.9	10.2	5.1	29.3	14.6
1972	385.5	21.5	5.6	25.4	6.6	164.3	42.6	28.3	7.3	51.2	13.3	43.6	11.3
1973	597.8	32.6	5.5	36.5	6.1	235.7	39.4	48.6	8.1	63.9	10.7	71.5	12.0
1974	727.4	72.2	9.9	48.6	6.7	309.2	42.5	74.2	10.2	50.4	6.9	89.9	12.4
1975	899.6	102.1	11.3	82.1	10.2	355.2	39.5	77.6	8.6	38.7	4.3	125.9	4.0
1976	976.8	63.8	9.8	76.6	7.8	447.9	45.9	79.6	8.1	48.3	4.9	138.0	14.1
1977	1,127.8	46.6(d)	4.1	45.6	4.0	504.6	44.7	83.7	7.4	153.7	13.6	144.9	12.8
1978	1,331.3	63.3(e)	4.8	116.7	8.8	536.8	40.3	150.0	11.3	165.9(f)	12.5	145.9	11.0
1979	1,243.8	18.5(d)	1.5	141.9	11.4	534.9	43.0	155.6	12.5	111.8	9.8	145.9	11.7
1980	1,145.6	32.3(e)	2.8	151.4	13.2	511.8	44.7	138.3	12.1	78.4	6.8	137.6	12.0

NA - Not Available.

(a) Bulgaria, Czechoslovakia, E. Germany, Hungary, Poland, Rumania, and U.S.S.R.
(b) United States, Austria, Belgium-Luxembourg, Canada, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.
(c) Percent of total Eastern Bloc machine tool imports from non-communist countries.
(d) Does not include Bulgarian imports.
(e) Does not include East German imports.
(f) Does not include Czechoslovakian imports.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools For Working Metals; and NMTBA.

COMMUNIST COUNTRIES' EXPORTS OF MACHINERY (a)

1973 to 1977

(Millions of U.S. Dollars)

Exporting Country	Total (b)	Exported to: Communist Countries (c)	Free Europe (Incl. Yugosl.)	U.S., Canada, Japan	Africa (Excl. S. Afr.)	Asia (d)	Latin America (e)
TOTAL							
1973	$ 9,143	$6,917	$638	$48	$298	$ 867	$284
1974	10,606	8,228	759	71	319	986	88
1975	12,401	9,323	929	80	341	1,067	117
1976	14,050	11,130	580	40	218	587	97
1977	15,605	12,726	665	45	250	785	110
U.S.S.R.							
1973	2,718	1,541	245	3	170	491	182
1974	3,357	2,249	232	10	154	555	11
1975	3553	2,051	252	17	136	540	22
1976	3,953	2,952	127	3	96	303	23
1977	4,759	3,538	153	3	115	28	
East Germany							
1973	2,254	1,959	123	11	45	78	37
1974	2,507	2,181	152	12	42	92	26
1975	2,972	2,615	169	9	36	114	24
1976	3,458	2,957	135	4	50	104	25
1977	3,833	3,328	150	5	54	104	27
Czechoslovakia							
1973	1,774	1,404	128	16	54	134	35
1974	1,973	1,511	160	22	81	153	32
1975	2,303	1,776	195	20	106	162	41
1976	2,700	2,032	130	8	38	113	28
1977	2,972	2,237	143	9	41	124	32
Poland							
1973	578	438	68	9	10	48	5
1974	641	454	96	17	9	54	10
1975	836	576	145	19	14	63	19
1976	1,124	855	91	12	12	54	13
1977	1,335	1,015	109	14	14	64	15
Hungary							
1973	587	514	22	1	3	41	6
1974	689	597	35	1	3	49	5
1975	910	749	74	1	5	77	4
1976	895	752	33	1	3	31	5
1977	1,055	886	38	1	3	37	6
Romania							
1973	388	269	34	7	11	59	8
1974	437	293	49	8	22	61	3
1975	561	372	58	13	30	83	4
1976	440	215	37	13	15	58	2
1977	495	242	42	14	16	65	2
Bulgaria							
1973	844	792	16	1	5	16	11
1974	1,002	943	26	1	8	22	1
1975	1,266	1,185	36	1	13	30	1
1976	1,481	1,358	27	1	6	23	1
1977	1,615	1,480	30	1	6	26	1

r - Revised.

(a) Note that these figures are for machinery in general and not for machine tools only.

(b) Total includes Australia, New Zealand, South Africa and not specified.

(c) U.S.S.R., East Germany, Czechoslovakia, Poland, Hungary, Romania, Bulgaria, Albania; beginning with 1974 includes Cuba and Outer Mongolia.

(d) Excluding Japan; beginning with 1974 excludes Outer Mongolia.

(e) Beginning with 1974 excludes Cuba.

Source: Verein Deutscher Maschinenbau-Anstalten, VDMA, "Statistisches Handbuch für den Maschinenbau" (annually).

7

EMPLOYMENT AND EARNINGS

If all the employees of the U.S. machine tool industry were to work for a single company, it would rank only about fiftieth among U.S. industrial corporations in total employment.

The industry is small, characterized by a substantial number of small and medium-sized establishments.

Employment fluctuates sharply with the fluctuations in new orders and shipments. Evidence of this is provided not only by the employment statistics but also by the labor turnover data in this chapter. These fluctuations create serious problems for the industry and for its employees. If employment has to be cut drastically, some of the highly skilled labor force is lost. When business experiences a quick upturn, there is a shortage of skilled workers. Extensive overtime is characteristic of the industry when orders are high.

To fill the gap in skilled workers, the industry sponsors training programs and NMTBA's Training Director assists Association members in solving a variety of manpower problems. However, the work force is getting older and it is becoming increasingly difficult to maintain a core of skilled workers.

Wages in the industry are competitive with those in comparable industries. Average hourly earnings for production workers in the metal cutting machine tool segment were $9.91 in 1983. Average earnings in the metal forming sector of the industry were $10.44. The average weekly hours worked by employees in the industry were 39.0 for metal cutting workers and 38.6 for metal forming workers.

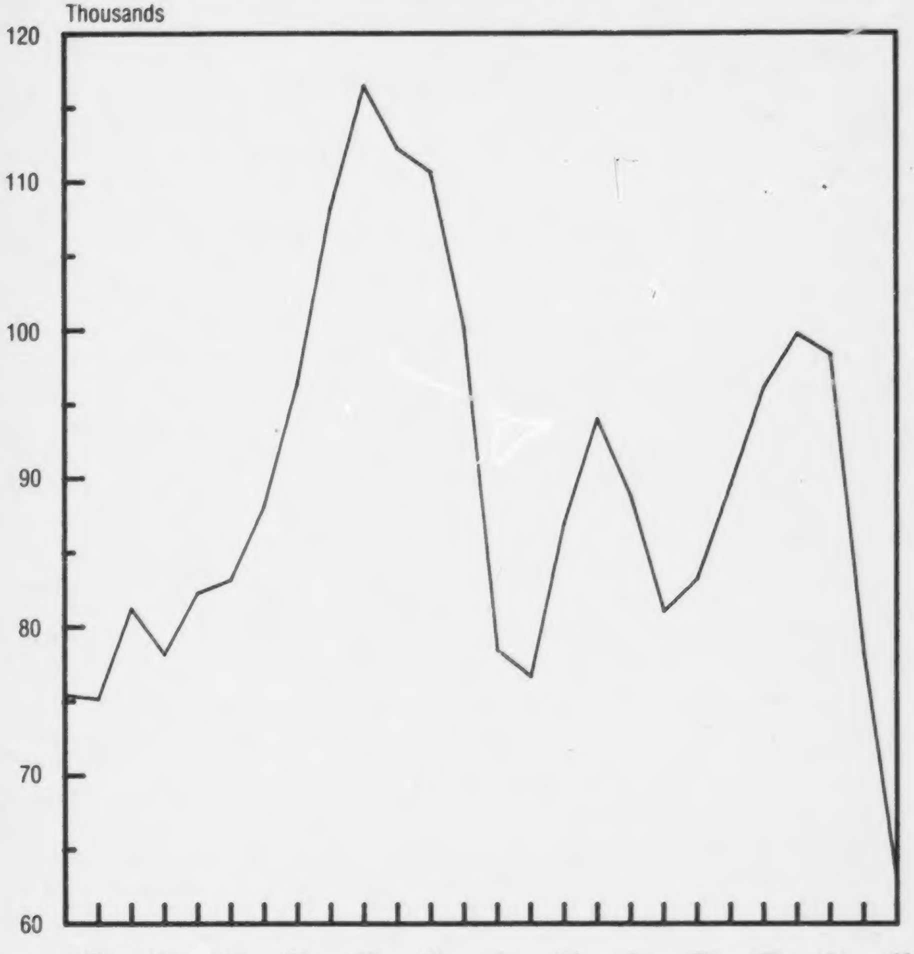
Work injury rates in metal cutting machine tool establishments are substantially lower, in lost workday cases, than the average for all manufacturing industries. The NMTBA Safety Director works closely with government agencies, industry members, and major industry customers to solve problems affecting safety and health.

Total compensation in the metal and metalworking industries in other countries has grown more rapidly than in the U.S. and in some cases is approaching equivalence. When the focus is narrowed to machine tools only, the total compensation of workers in the U.S. machine tool industry is still the highest among the major machine tool producing nations.

Most of the data in this chapter comes from the U.S. Bureau of Labor Statistics; some is from the U.S. Bureau of the Census. The regular Census data are based on complete enumerations of all workers covered; most other data are based on sample surveys. For definitions and further explanations of the terms used in this chapter see the Glossary at the end of this book.

Employment in the Machine Tool Industry

1958 to Date



Note: Estimate by NMTBA for 1977 and 1978.

Sources: U.S. Bureau of the Census. "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
1937 to Date

	Machine Tool Total		Metal Cutting		Metal Forming	
Year	All Employees	Production Workers	All Employees	Production Workers	All Employees	Production Workers
1937	NA	NA	NA	37,477	NA	NA
1939	NA	NA	NA	36,997	NA	NA
1947	NA	NA	70,001	54,435	NA	NA
1949	NA	NA	52,384	38,584	NA	NA
1950	NA	NA	54,747	41,555	NA	NA
1951	NA	NA	83,855	64,029	NA	NA
1952	NA	NA	102,735	79,471	NA	NA
1953	NA	NA	99,494	76,840	NA	NA
1954	NA	NA	80,959	62,106	NA	NA
1955	NA	NA	77,063	58,600	NA	NA
1956	NA	NA	85,469	65,208	NA	NA
1957	NA	NA	79,895	59,600	NA	NA
1958	75,366	51,726	52,864	36,154	22,502	15,572
1959	75,091	53,332	52,797	35,436	22,294	17,896
1960	81,200	57,439	58,777	39,487	22,423	17,952
1961	78,108	54,633	54,901	36,373	23,207	18,260
1962	82,251	57,662	58,855	39,253	23,396	18,409
1963	83,136	56,790	61,058	41,008	22,078	15,782
1964	88,079	61,196	65,078	44,471	23,001	16,725
1965	96,334	67,257	70,827	48,745	25,517	18,512
1966	108,174	76,190	79,767	55,279	28,407	20,911
1967	116,400	81,400	87,200	60,500	29,200	20,900
1968	112,200	76,900	84,300	57,500	27,900	19,400
1969	110,600	74,700	82,600	55,300	28,000	19,400
1970	100,200	65,900	71,300	45,800	28,900	20,100
1971	78,400	49,200	54,000	33,200	24,400	16,000
1972	76,600	50,000	52,500	33,400	24,100	16,600
1973	86,900	58,700	59,900	39,800	27,000	18,900
1974	94,000	64,200	65,000	43,900	29,000	20,300
1975	88,800	58,500	62,800	40,800	26,000	17,700
1976	81,000	53,500	58,100	37,600	22,900	15,900
1977	83,200	53,400	59,500	37,300	23,700	16,100
1978	89,500	59,200	64,300	42,200	25,200	17,000
1979	96,100	64,400	69,100	45,700	27,000	18,700
1980	99,700	66,000	72,800	47,800	26,900	18,200
1981	98,300	63,900	74,300	47,900	24,000	16,000
1982(r)	78,200	46,900	58,700	34,800	19,500	12,100
1983E	62,660	37,577	47,032	27,881	15,627	9,697

NA - Not Available. E - Estimate by NMTBA. r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	81,200	$ 523.0	57,439	116.7	$ 324.7
1962	82,251	573.8	57,662	118.2	344.5
1964	88,079	678.0	61,196	135.2	428.4
1966	108,174	918.3	76,190	171.2	591.7
1968	112,200	1,001.0	76,900	163.1	619.7
1970	100,200	965.3	65,900	136.6	572.6
1971	78,400	774.6	49,200	97.4	428.7
1972	76,600	839.2	50,000	103.3	489.7
1973	86,900	1,033.0	58,700	125.1	623.0
1974	94,000	1,245.2	64,200	135.8	748.0
1975	88,800	1,193.4	58,500	117.5	695.2
1976	81,000	1,182.2	53,500	105.5	688.1
1977	83,200	1,311.7	53,400	109.4	761.6
1978	89,500	1,536.3	59,200	123.3	932.8
1979	96,100	1,789.7	64,400	133.4	1,092.0
1980	99,700	2,018.1	66,000	134.0	1,202.7
1981	98,300	2,129.8	63,900	129.3	1,259.0
1982	78,200	1,770.8	46,900	88.9	964.5

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufacturers."

EMPLOYMENT AND COMPENSATION
Metal Forming Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	22,423	$152.1	17,952	35.8	$100.9
1962	23,396	172.0	18,409	37.0	109.5
1964	23,001	180.3	16,725	37.9	121.6
1966	28,407	244.9	20,911	47.4	164.2
1968	27,900	245.8	19,400	42.9	157.4
1970	28,900	280.6	20,100	43.4	177.3
1971	24,400	241.5	16,000	32.9	142.5
1972	24,100	265.4	16,600	34.7	163.8
1973	27,000	323.6	18,900	41.8	205.1
1974	29,000	370.8	20,300	43.3	238.2
1975	26,000	343.1	17,700	35.8	208.2
1976	22,900	336.8	15,900	32.0	214.2
1977	23,700	360.7	16,100	32.8	219.4
1978	25,200	415.6	17,000	35.1	253.2
1979	27,000	485.6	18,700	37.5	305.1
1980	26,900	514.1	18,200	35.2	313.2
1981	24,000	496.8	16,000	30.8	294.9
1982	19,500	439.0	12,100	23.3	245.6

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Metal Cutting Machine Tool Industry
1937 to Date

Year	All Employees		Production Workers		
	Number	Payroll (Million $)	Number	Man-Hours (Million)	Wages (Million $)
1937	NA	NA	37,477	NA	$ 62.6
1939	NA	NA	36,997	NA	62.9
1947	70,001	$ 234.0	54,435	113.4	165.0
1949	52,384	190.4	38,584	74.5	120.0
1950	54,747	226.8	41,555	88.6	150.6
1951	83,855	396.4	64,029	155.7	281.0
1952	102,735	524.5	79,471	194.6	385.3
1953	99,494	537.6	76,840	175.3	392.6
1954	80,959	432.3	62,106	133.2	302.7
1955	77,063	426.6	58,600	128.1	297.2
1956	85,469	511.9	65,200	147.5	360.6
1957	79,895	470.9	59,600	125.4	319.3
1958	52,864	300.3	35,154	69.6	182.2
1959	52,797	329.5	36,436	72.2	202.0
1960	58,777	370.9	39,487	80.9	223.8
1961	54,901	353.0	36,373	72.7	201.5
1962	58,855	401.8	39,253	81.2	235.0
1963	61,058	438.2	41,008	86.5	272.2
1964	65,078	497.7	44,471	97.3	306.8
1965	70,827	565.0	48,745	108.1	353.7
1966	79,767	673.4	55,279	123.8	427.5
1967	87,200	759.9	60,500	131.8	476.5
1968	84,300	755.2	57,500	120.2	462.3
1969	82,600	791.6	55,300	116.0	477.5
1970	71,300	684.7	45,800	93.2	395.3
1971	54,000	533.1	33,200	64.5	286.2
1972	52,500	573.8	33,400	68.2	325.9
1973	59,900	709.4	39,800	83.3	417.9
1974	65,000	874.4	43,900	92.5	509.8
1975	62,800	850.3	40,800	81.7	486.8
1976	58,100	845.4	37,600	73.5	473.9
1977	59,500	951.0	37,300	76.6	542.2
1978	64,300	1,120.7	42,200	88.2	679.6
1979	69,100	1,304.1	45,700	95.9	786.9
1980	72,800	1,504.0	47,800	98.8	889.5
1981	74,300	1,633.0	47,900	98.5	964.1
1982	58,700	1,331.8	34,800	65.6	718.9

NA - Not Available.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Metal Cutting Machine Tool Industry
Monthly, 1981 to Date

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1981 (r)	1982 (r)	1983	1981 (r)	1982 (r)	1983
Jan.	53.8	47.8	31.3	43.7	40.7	37.9
Feb.	53.2	47.3	30.8	43.0	40.6	37.3
Mar.	53.3	46.2	29.5	43.3	39.7	38.1
Apr.	53.1	43.3	29.1	42.0	39.3	38.5
May	52.4	41.5	29.0	42.3	38.9	37.9
June	52.6	40.1	29.3	42.1	38.7	38.1
July	51.8	36.8	28.8	41.3	38.8	38.8
Aug.	51.3	36.2	29.1	41.4	37.8	38.2
Sept.	52.1	35.2	29.8	41.3	37.8	39.7
Oct.	51.5	33.0	30.1	41.3	36.7	40.1
Nov.	49.8	32.6	31.0	41.5	37.4	41.1
Dec.	49.1	31.7	31.4	42.1	38.6	42.3
Yearly Avg.	52.0	39.3	29.9	42.1	38.9	39.0

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

LABOR TURNOVER IN THE METAL CUTTING MACHINE TOOL INDUSTRY
1959 to 1981

	Total Accessions	Total Separations	New Hires	Quits	Layoffs
Year	Per 100 Employees (a)				
1959	3.4	1.9	1.5	.7	.8
1960	1.9	2.4	1.3	.7	1.2
1961	2.0	1.9	1.1	.6	.9
1962	2.0	1.7	1.5	.8	.5
1963	1.8	1.6	1.5	.7	.4
1964	2.2	1.6	1.9	.9	.2
1965	2.5	1.8	2.3	1.2	.1
1966	3.1	2.4	2.9	1.7	.1
1967	2.4	2.3	2.1	1.5	.2
1968	1.8	2.4	1.5	1.4	.5
1969	2.3	2.3	2.0	1.4	.3
1970	1.4	4.0	.9	.9	2.4
1971	1.7	2.8	.6	.6	1.7
1972	2.6	2.0	1.6	.9	.5
1973	3.2	2.3	2.9	1.4	.1
1974	2.4	2.1	2.2	1.3	.2
1975	1.1	2.5	.6	.6	1.3
1976	1.9	1.6	1.0	.6	.5
1977	1.9	1.7	1.5	.8	.4
1978	2.1	1.7	1.8	.9	.2
1979	2.4	1.7	2.1	1.0	.1
1980	1.6	1.5	1.4	.7	.3
1981	1.0	1.6	.8	.6	.6

(a) Data relates to "All Employees".

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics. 1909-70" (also monthly).

EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY
Monthly, 1982 to Date
(Employment in Thousands)

Month	1982 (r)	% Change 1981:1982	1983	% Change 1982:1983
Jan.	75.3	-7.4	53.6	-28.8
Feb.	74.9	-7.5	53.1	-29.1
Mar.	73.8	-8.9	52.0	-29.5
Apr.	70.3	-13.0	51.3	-27.0
May	67.9	-15.4	51.4	-24.3
June	66.1	-18.0	51.6	-21.9
July	61.8	-23.1	50.8	-17.8
Aug.	61.5	-23.0	50.8	-17.4
Sep.	59.8	-25.6	51.7	-13.5
Oct.	56.7	-28.9	51.7	-8.8
Nov.	55.8	-28.2	52.8	-5.4
Dec.	54.5	-29.2	53.3	-2.2
Yearly Avg.	64.9	-18.9	52.0	-19.9

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY
1958 to Date
(Average Annual Employment in Thousands)

Year	All Employees	Production Workers	Female Employees
1958	64.7	43.8	6.3
1959	64.8	44.3	6.0
1960	69.5	48.2	6.5
1961	63.3	42.8	5.9
1962	63.7	43.7	5.8
1963	63.6	44.0	5.7
1964	67.1	46.7	5.8
1965	72.8	50.8	6.2
1966	79.4	55.7	7.1
1967	83.3	57.9	7.9
1968	80.0	54.5	7.6
1969	77.4	52.2	7.4
1970	69.2	45.5	6.8
1971	54.9	34.9	5.4
1972	55.8	35.8	5.5
1973	63.7	42.6	6.4
1974	67.8	45.6	7.1
1975	63.3	41.8	6.5
1976	59.9	38.8	6.4
1977	65.2	41.9	7.3
1978	70.9	45.9	8.4
1979	77.4	51.2	9.7
1980	81.6	54.7	10.6
1981(r)	80.0	52.0	10.7
1982(r)	64.9	39.3	8.8
1983(p)	52.0	29.9	7.3

r - Revised. p - Preliminary.

Note: The figures published by the Bureau of Labor Statistics are based on sample surveys and differ from the figures shown by the Census.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-78" (also monthly).

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Metal Forming Machine Tool Industry
Monthly, 1981 to Date

Month	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
	1981 (r)	1982 (r)	1983	1981	1982	1983
Jan.	15.8	15.0	9.8	40.2	37.4	38.7
Feb.	15.6	14.7	9.5	40.1	38.8	37.9
Mar	15.5	14.5	9.6	40.0	38.6	38.6
Apr.	15.3	13.8	9.6	39.7	37.9	38.5
May	15.4	13.3	9.9	40.1	37.3	37.1
June	15.5	12.8	9.8	39.7	37.9	36.7
July	15.3	12.5	9.8	37.6	37.2	37.7
Aug.	14.4	12.1	9.7	38.2	37.1	37.6
Sept.	14.6	11.4	10.2	39.1	36.9	38.4
Oct.	15.5	10.7	10.4	38.4	38.5	39.7
Nov.	15.5	10.5	10.7	39.3	38.4	40.2
Dec.	15.6	10.2	10.7	39.0	39.6	41.2
Yearly Avg.	15.3	12.6	10.0	39.3	38.0	38.6

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

EMPLOYMENT IN THE METAL FORMING MACHINE TOOL INDUSTRY
1977 to Date
(Average Annual Employment in Thousands)

Year	All Employees	Production Workers	Female Employees
1977	23.3	15.4	NA
1978	25.0	16.5	NA
1979	26.9	17.7	NA
1980	26.4	17.0	NA
1981(r)	24.4	15.3	NA
1982(r)	21.0	12.6	2.2
1983	17.2	10.0	1.7

r - Revised.

Note: The figures published by the Bureau of Labor Statistics are based on sample surveys and differ from the figures shown by the Census.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (annual and monthly).

HOURS AND GROSS EARNINGS OF PRODUCTION WORKERS
Metalworking and Metal Cutting Industries, 1937 to Date

Year	Metalworking Machinery Industry			Metal Cutting Machine Tool Industry		
	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
1937	NA	NA	NA	$ 32.48	44.8	$ .73
1938	NA	NA	NA	26.75	36.0	.74
1939	NA	NA	NA	32.34	42.5	.76
1940	NA	NA	NA	37.44	48.0	.78
1941	NA	NA	NA	44.22	51.6	.86
1942	NA	NA	NA	52.70	53.5	.99
1943	NA	NA	NA	55.11	50.7	1.09
1944	NA	NA	NA	58.19	50.6	1.15
1945	NA	NA	NA	57.14	47.9	1.19
1946	NA	NA	NA	54.40	42.8	1.27
1947	$ 58.69	42.5	$1.38	57.87	42.3	1.37
1948	63.13	42.4	1.49	61.68	42.1	1.47
1949	61.33	39.8	1.54	59.23	39.2	1.51
1950	71.73	43.5	1.65	69.87	43.1	1.62
1951	86.01	47.4	1.83	85.14	47.3	1.80
1952	92.20	46.8	1.97	90.24	47.0	1.92
1953	96.81	46.1	2.10	95.17	46.2	2.06
1954	93.09	42.9	2.17	89.25	42.5	2.10
1955	98.34	43.9	2.24	95.48	43.6	2.19
1956	108.96	45.4	2.40	106.25	45.6	2.33
1957	106.89	43.1	2.48	101.04	42.1	2.40
1958	102.00	40.0	2.55	91.20	38.0	2.40
1959	113.74	42.6	2.67	106.93	42.1	2.54
1960	117.27	42.8	2.74	110.99	42.2	2.63
1961	117.04	41.8	2.80	111.92	41.3	2.71
1962	125.57	43.3	2.90	119.41	42.8	2.79
1963	128.90	43.4	2.97	124.42	43.2	2.88
1964	137.06	44.5	3.08	132.01	44.3	2.98
1965	144.37	45.4	3.18	138.76	45.2	3.07
1966	153.72	46.3	3.32	150.20	46.5	3.23
1967	154.56	44.8	3.45	154.25	45.5	3.39
1968	158.70	43.6	3.64	152.65	43.0	3.55
1969	172.38	44.2	3.[illegible]	166.61	43.5	3.83
1970	174.28	42.3	4.12	166.00	41.5	4.00
1971	174.62	40.8	4.28	163.90	39.4	4.16
1972	198.29	43.2	4.59	194.71	42.7	4.56
1973	214.90	44.4	4.84	219.11	44.9	4.88
1974	225.33	43.5	5.18	232.74	44.5	5.23
1975	226.46	41.1	5.51	232.68	42.0	5.54
1976	248.89	41.9	5.94	249.96	41.8	5.98
1977	279.72	43.1	6.49	290.18	43.9	6.61
1978	308.88	44.0	7.02	322.56	44.8	7.20
1979	329.30	43.5	7.57	344.21	44.3	7.77
1980	346.83	42.4	8.18	366.21	43.7	8.38
1981(r)	371.90	41.6	8.94	383.95	42.1	9.12
1982(r)	380.09	39.8	9.55	380.44	38.9	9.78
1983	399.27	40.7	9.81	386.49	39.0	9.91

NA - Not Available.   r - Revised.

Note: Earnings figures include overtime and premium pay.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-78" (also monthly).

AVERAGE WEEKLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1937 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1937	$ 26.61	NA	$ 32.66	NA	NA	$ 32.48
1938	23.70	NA	30.59	NA	NA	26.75
1939	26.19	NA	33.58	NA	NA	32.34
1940	28.07	NA	36.69	NA	NA	37.44
1941	33.56	NA	42.68	NA	NA	44.22
1942	42.17	NA	54.15	NA	NA	52.70
1943	48.73	NA	59.13	NA	NA	55.11
1944	51.38	NA	60.12	NA	NA	58.19
1945	48.36	NA	55.28	NA	NA	57.14
1946	46.22	NA	52.28	NA	NA	54.40
1947	51.76	$ 57.58	58.63	$ 54.74	$ 58.69	57.87
1948	56.36	60.38	63.15	60.97	63.13	61.68
1949	57.25	60.31	67.33	63.34	61.33	59.23
1950	62.43	67.08	74.85	68.10	71.73	69.87
1951	68.48	76.13	77.16	77.96	86.01	85.14
1952	72.63	79.55	84.87	81.27	92.20	90.24
1953	76.63	82.68	89.88	83.38	96.81	95.17
1954	76.19	81.40	91.30	84.66	93.09	89.25
1955	82.19	87.36	99.84	89.21	98.34	95.48
1956	85.28	93.06	96.82	95.57	108.96	106.25
1957	88.26	94.12	100.61	96.35	106.89	101.04
1958	89.27	94.33	101.24	101.25	102.00	91.20
1959	96.05	102.92	111.38	106.63	113.74	106.93
1960	97.44	104.55	115.21	110.43	117.27	110.99
1961	100.35	107.42	114.65	114.68	117.04	111.92
1962	104.70	113.01	127.67	119.97	125.57	119.41
1963	108.09	116.20	132.68	122.43	128.90	124.42
1964	112.19	121.69	138.03	125.03	137.06	132.01
1965	117.18	127.58	147.63	131.88	144.37	138.76
1966	122.09	135.34	147.23	143.32	153.72	150.20
1967	123.60	135.89	144.84	146.97	154.56	154.25
1968	132.07	141.88	167.66	152.04	158.70	152.65
1969	139.59	152.15	170.56	161.35	172.38	166.61
1970	143.47	154.95	170.47	168.92	174.28	166.00
1971	153.52	161.99	195.29	175.82	174.62	163.90
1972	167.27	179.34	219.22	193.44	198.29	194.71
1973	179.28	193.83	237.08	207.50	214.90	219.11
1974	190.48	207.62	239.54	218.70	225.33	232.74
1975	205.09	219.22	262.68	246.19	226.46	232.68
1976	225.33	236.74	305.30	263.16	248.89	249.96
1977	248.46	259.79	345.40	289.95	279.72	290.18
1978	270.44	285.44	368.05	318.19	308.88	322.56
1979	290.90	305.98	372.37	351.05	329.30	344.21
1980	310.78	328.00	394.00	389.76	346.83	366.21
1981(r)	343.31	360.33	450.72	425.80	371.90	383.95
1982(r)	356.06	368.81	470.61	461.55	380.09	380.44
1983	382.58	390.02	525.66	487.81	399.27	386.49

NA - Not Available.   r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-78" (also monthly).

AVERAGE HOURLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1937 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1937	$ .67	NA	$ .88	NA	NA	$ .73
1938	.68	NA	.91	NA	NA	.74
1939	.69	NA	.92	NA	NA	.76
1940	.72	NA	.94	NA	NA	.78
1941	.80	NA	1.04	NA	NA	.86
1942	.94	NA	1.17	NA	NA	.99
1943	1.05	NA	1.24	NA	NA	1.09
1944	1.11	NA	1.27	NA	NA	1.15
1945	1.10	NA	1.27	NA	NA	1.19
1946	1.14	NA	1.35	NA	NA	1.27
1947	1.28	$ 1.34	1.47	$ 1.37	$ 1.38	1.37
1948	1.40	1.46	1.61	1.49	1.49	1.47
1949	1.45	1.52	1.70	1.56	1.54	1.51
1950	1.52	1.60	1.78	1.64	1.65	1.62
1951	1.65	1.75	1.91	1.78	1.83	1.80
1952	1.75	1.85	2.05	1.89	1.97	1.92
1953	1.86	1.95	2.14	1.99	2.10	2.06
1954	1.90	2.00	2.20	2.07	2.17	2.10
1955	1.99	2.08	2.29	2.16	2.24	2.19
1956	2.08	2.20	2.35	2.27	2.40	2.33
1957	2.19	2.29	2.46	2.35	2.48	2.40
1958	2.26	2.37	2.55	2.50	2.55	2.40
1959	2.36	2.48	2.71	2.62	2.67	2.54
1960	2.43	2.55	2.81	2.70	2.74	2.63
1961	2.49	2.62	2.86	2.77	2.80	2.71
1962	2.56	2.71	2.99	2.87	2.90	2.79
1963	2.63	2.78	3.10	2.95	2.97	2.88
1964	2.71	2.87	3.21	3.02	3.08	2.98
1965	2.79	2.96	3.34	3.14	3.18	3.07
1966	2.90	3.09	3.44	3.31	3.32	3.23
1967	3.00	3.19	3.55	3.45	3.45	3.39
1968	3.19	3.37	3.89	3.62	3.64	3.55
1969	3.38	3.58	4.10	3.86	3.90	3.83
1970	3.56	3.77	4.23	4.12	4.12	4.00
1971	3.80	3.99	4.74	4.32	4.28	4.16
1972	4.05	4.27	5.11	4.65	4.59	4.56
1973	4.32	4.55	5.45	5.00	4.84	4.88
1974	4.68	4.92	5.90	5.40	5.18	5.23
1975	5.14	5.36	6.47	5.99	5.51	5.54
1976	5.55	5.76	7.10	6.45	5.94	5.98
1977	6.06	6.26	7.85	6.92	6.49	6.61
1978	6.58	6.78	8.50	7.54	7.02	7.20
1979	7.13	7.32	9.06	8.26	7.57	7.77
1980	7.75	8.00	9.85	9.28	8.18	8.38
1981(r)	8.54	8.81	11.02	10.31	8.94	9.12
1982(r)	9.06	9.29	11.62	11.23	9.55	9.76
1983	9.40	9.63	12.14	11.84	9.81	9.91

NA - Not Available.   r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-78" (also monthly).

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)
In Selected Areas by Occupation, 1978, 1981, 1983

Region and Survey Year	Occupation: Machine Tool Operators, Production: Class A (b)	Class B (c)	Class C (d)	Numerically Controlled (r)	Tool Room One Type Machine (r)
1. Baltimore, Md.					
Jan. 1978	$ 6.74	$ 5.79	$ 5.24	$ 5.67	$ 6.54(e)
Jan. 1981	9.01	7.84	7.01	8.45	NA
Nov. 1983	10.65	9.61	7.83	10.25	NA
2. Boston, Mass.					
Jan. 1978	6.54	6.01	4.71	6.24	6.72
Jan. 1981	8.59	8.35	5.87	8.71	NA
Nov. 1983	10.99	10.16	NA	9.99	NA
3. Buffalo, N.Y.					
Jan. 1978	6.77	6.28	5.44	7.00	6.80
Jan. 1981	8.97	8.25	7.01	9.47	7.77
Nov. 1983	10.06	8.15	7.29	11.24	10.92
4. Chicago, Ill.					
Jan. 1978	7.38	6.51	5.90	7.55	8.36
Jan. 1981	9.60	8.00	6.63	9.68	11.12
Nov. 1983	11.50	9.28	8.39	11.03	12.63
5. Cleveland, Ohio					
Jan. 1978	7.02	6.01	4.12	7.17	7.09
Jan. 1981	9.43	8.13	6.78	9.41	9.68
Nov. 1983	10.15	8.92	7.10	10.40	10.67
6. Denver, Colo.					
Jan. 1978	6.60	5.36	5.04	6.44	6.63
Jan. 1981	9.30	7.23	NA	8.61	10.68
Nov. 1983	10.41	7.92	5.83	10.26	11.32
7. Detroit, Mich.					
Jan. 1978	8.19	7.01	5.48	7.14	8.94
Jan. 1981	11.61	9.48	6.21	9.96	11.98
Nov. 1983	12.70	10.92	9.58	11.61	12.39
8. Houston, Tx.					
Jan. 1978	7.15	6.66	4.89	7.29	7.26
Jan. 1981	9.92	8.96	5.93	10.25	10.47
Nov. 1983	11.56	9.71	9.68	11.86	11.55
9. L.A.-Long Beach, Cal.					
Jan. 1978	6.87	5.45	3.96	6.86	7.44
Jan. 1981	9.38	7.39	4.83	9.79	9.70
Nov. 1983	12.71	8.38	NA	14.72	12.46
10. Milwaukee, Wis.					
Jan. 1978	7.78	6.89	NA	7.43	7.86
Jan. 1981	10.47	9.91	8.45	10.36	10.63
Nov. 1983	11.71	11.37	10.22	12.06	11.89
11. Newark, N.J.					
Jan. 1978	6.50	6.59	4.85	6.29	7.47
Jan. 1981	9.44	9.04	6.35	7.68	9.25
Nov. 1983	9.83	9.38	5.31	10.54	10.45
12. Pittsburgh, Pa.					
Jan. 1978	7.15	6.71	6.15	6.69	7.21(e)
Jan. 1981	9.44	8.80	8.14	9.38	NA
Nov. 1983	10.53	8.89	7.48	11.46	10.13
13. St. Louis, Mo.-Ill.					
Jan. 1978	8.25	6.14	6.12	7.26	8.03
Jan. 1981	9.45	8.36	8.30	9.27	8.69
Nov. 1983	11.63	9.20	7.27	11.36	12.00

NA - Not Available. r - Revised.

(a) Nonelectrical Machinery (SIC 35).

(b) Operators who set up their own machines and perform a variety of machine operations to close tolerances using decisions based on blueprints and layouts.

(c) Operators who set up their own machines and maintain operation set-ups made by others.

(d) Operators who perform routine and repetitive operations but do not set up machines.

(e) More than one type of machine.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1978, 1981, 1983

(Continued)

	Occupation					
	Assemblers		Inspectors		Laborers, Material Handling	Tool Clerks
	Class A (f)	Class B (g)	Class A (h)	Class B (i)		
1.	$ 6.03	$ 5.71	$ 6.72	NA	$ 5.13	$ 5.38
	8.00	6.88	8.88	$7.72	7.21	NA
	11.00	7.10	11.45	8.04	5.96	NA
2.	6.18	4.89	NA	5.26	4.56	5.73
	8.31	6.62	8.47	7.44	6.18	7.22
	9.14	7.24	10.01	8.53	6.54	9.26
3.	6.92	6.43	7.20	6.36	NA	5.86
	9.24	8.07	9.35	7.62	8.11	7.80
	10.36	10.27	10.95	9.54	8.66	8.36
4.	6.84	6.49	7.43	6.80	5.86	6.47
	8.95	7.43	9.25	8.56	6.81	9.10
	11.01	8.93	11.54	10.11	8.35	10.15
5.	7.21	6.13	7.20	6.65	6.07	6.50
	9.64	7.80	9.93	8.46	8.90	8.86
	11.02	7.43	10.99	9.09	8.90	10.13
6.	5.94	4.30	6.67	5.93	4.75	5.89
	7.79	5.40	8.55	7.04	5.89	7.54
	9.53	7.05	9.82	NA	NA	NA
7.	7.80	7.23	7.79	6.50	6.94	7.13
	11.17	9.59	11.01	NA	9.45	9.80
	12.47	11.23	12.33	10.75	10.50	11.59
8.	6.89	5.86	7.37	6.43	5.38	6.36
	9.75	9.06	10.07	8.45	7.41	7.80
	10.89	10.77	11.57	11.22	9.15	9.20
9.	6.29	4.41	6.74	5.50	4.67	5.24
	8.02	6.09	9.77	7.24(r)	5.74	6.93
	10.15	7.29	11.90	7.10	8.45	9.15
10.	7.72	6.96	7.24	6.97	6.19	6.28
	10.31	10.05(r)	10.45(r)	9.91(r)	9.24(r)	10.12(r)
	11.45	10.76	11.82	10.92	10.51	10.95
11.	6.54	5.71	5.95	6.61	4.96	5.74
	7.93	5.90	7.83	7.77	7.21	7.82(r)
	9.47	8.04	9.60	8.27	6.36	9.09
12.	7.14	6.02	7.37	6.66	5.33	6.18
	8.52	7.78	9.44	8.79	8.74	7.48
	9.74	7.63	11.22	10.50	9.68	10.08
13.	6.91	5.81	7.24	6.23	5.11	5.81
	9.10	7.57	9.04	8.35	6.79	7.86
	11.49	8.73	10.58	9.44	8.05	9.22

r - Revised.

(f) Fits and adjusts parts and makes decisions regarding proper performance of component or unit.
(g) Assembles parts in accordance with standard and prescribed procedures. Requires some fitting and adjusting.
(h) Responsible for decisions regarding quality of product and operations. Troubleshooting and interpreting of drawings and specifications is involved.
(i) Tests products and processes having rigid specifications with established inspection procedures.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

SELECTED LABOR RATIOS
1961 to Date

	Payroll per Employee	Prod. Wkrs. % of Total Employment	Annual Man-Hours of Prod. Workers	Average Hourly Earnings, Prod.Workers	Value Added Per Employee	Payroll as % of Value Added	Value Added per Man Hour of Prod. Wkrs.
METAL CUTTING MACHINE TOOL INDUSTRY							
1961	$ 6,429	66%	1,999	$ 2.77	$10,020	64%	$ 7.57
1962	6,827	67	2,069	2.89	11,401	60	8.26
1963	7,171	67	2,109	3.14	11,445	62	8.08
1964	7,645	68	2,186	3.15	12,844	59	8.59
1965	7,980	68	2,219	3.27	14,033	56	9.19
1966	8,438	69	2,238	3.45	15,466	54	9.96
1967	8,714	69	2,178	3.61	15,955	54	10.55
1968	8,958	68	2,090	3.84	16,335	54	11.45
1969	9,583	66	2,097	4.11	17,451	54	12.42
1970	9,603	64	2,034	4.24	15,597	61	11.93
1971	9,872	61	1,942	4.43	15,181	65	12.71
1972	10,929	63	2,041	4.77	17,175	63	13.22
1973	11,843	65	2,092	5.01	20,268	58	14.57
1974	13,452	67	2,107	5.51	24,876	54	17.48
1975	13,539	64	2,002	5.95	26,119	51	20.07
1976	14,550	64	1,954	6.44	28,641	50	22.64
1977	15,983	63	2,054	7.08	31,445	51	24.43
1978	17,429	66	2,090	7.71	35,257	49	25.70
1979	18,873	66	2,098	8.21	41,010	46	29.55
1980	20,659	66	2,067	9.00	46,005	45	33.90
1981(r)	21,978	64	2,056	9.79	50,199	44	37.87
1982(p)	22,688	59	1,885	10.96	NA	NA	NA
METAL FORMING MACHINE TOOL INDUSTRY							
1961	$ 6,818	79%	1,905	$ 2.91	$ 9,552	71%	$ 6.37
1962	7,351	79	2,012	2.96	11,363	65	7.18
1963	7,316	71	2,189	3.10	12,728	57	8.13
1964	7,839	72	2,269	3.20	13,847	56	8.40
1965	8,058	72	2,243	3.34	13,686	58	8.40
1966	8,623	73	2,267	3.46	15,214	56	9.11
1967	8,547	71	2,210	3.57	14,972	57	9.46
1968	8,810	69	2,211	3.66	16,247	54	10.56
1969	9,664	69	2,185	4.05	16,182	59	10.68
1970	9,709	69	2,159	4.08	16,249	59	10.82
1971	9,897	65	2,056	4.33	14,913	66	11.06
1972	11,012	68	2,090	4.72	17,331	63	12.03
1973	11,985	70	2,211	4.90	20,240	59	13.07
1974	12,786	70	2,133	5.50	21,851	58	14.63
1975	13,196	68	2,022	5.81	23,780	55	17.27
1976	14,707	69	2,012	6.69	27,122	54	19.40
1977	15,219	68	2,037	6.69	30,460	50	22.01
1978	16,492	68	2,065	7.21	33,385	49	23.97
1979	17,985	69	2,005	8.14	37,185	48	26.77
1980	19,112	68	1,934	8.90	38,740	49	29.61
1981	20,700	67	1,925	9.57	40,688	51	31.70
1982(p)	22,513	62	1,926	10.54	NA	NA	NA

p - Preliminary. NA - Not Available. r - Revised.

Source: 1963, 1967, 1972, 1977, 1982: U.S. Bureau of the Census, "Census of Manufactures," 1977, Industry Series: "Metalworking Machinery and Equipment," MC 77-1-35C and earlier years. Other Years: U .S. Bureau of the Census, "Annual Survey of Manufactures" (Annually).

WEEKLY OVERTIME HOURS OF PRODUCTION WORKERS
Selected Industry Groups, 1958 to Date, Annual Averages

Year	Manufacturing	Durable Goods Industry	Nonelectrical Machinery Machinery industry	Metalworking Machinery Industry
1958	2.0	1.9	1.8	2.5
1959	2.7	2.7	2.9	4.0
1960	2.4	2.4	2.7	4.3
1961	2.4	2.3	2.5	3.4
1962	2.8	2.8	3.1	4.7
1963	2.8	2.9	3.2	4.8
1964	3.1	3.3	3.9	5.9
1965	3.6	3.9	4.6	6.7
1966	3.9	4.3	5.5	7.8
1967	3.4	3.5	4.4	6.5
1968	3.6	3.8	4.0	5.4
1969	3.6	3.8	4.5	6.0
1970	3.0	2.9	3.2	4.3
1971	2.9	2.9	2.6	2.8
1972	3.5	3.6	3.8	4.9
1973	3.8	4.1	4.7	6.4
1974	3.2	3.4	4.3	5.8
1975	2.6	2.5	3.0	3.3
1976	3.1	3.1	3.1	4.0
1977	3.5	3.7	4.0	5.5
1978	3.6	3.8	4.3	5.9
1979	3.3	3.5	4.0	5.7
1980	2.8	2.8	3.4	4.8
1981	2.8	2.8	3.2	4.1
1982	2.3	2.2	2.2	2.7
1983	3.0	3.0	2.7	3.3

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings", monthly and annual supplements.

WORK INJURY RATES
By Industry, 1982

Industry	Incidence Rates (per 100 Employees)			Average Lost Workdays Per Lost Workday Case
	Total Recordable Cases	Lost Workday Cases	Nonfatal Cases Without Lost Workdays	
Manufacturing	9.9	4.3	5.6	17.0
Fabricated Metal Products	14.9	6.2	8.7	16.0
Metal Stampings	14.6	5.7	8.9	16.0
Machinery Except Electrical	10.5	4.1	6.4	16.0
Engines and Turbines	7.8	3.5	4.3	18.0
Construction and Related Machinery	14.3	5.9	8.4	16.0
Metalworking Machinery	11.0	3.6	7.4	16.0
Machine Tools, Metal Cutting Types	11.3	4.1	7.2	16.0
Machine Tools, Metal Forming Types	12.8	4.9	7.9	17.0
Special Industry Machinery	12.6	4.7	7.9	15.0
General Industrial Machinery	12.0	4.8	7.2	16.0
Transportation Equipment	8.8	3.9	4.8	18.0
Motor Vehicles and Equipment	8.2	3.4	4.8	16.0

Note: Data represents work-related injuries and illnesses in comparable industries.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

AVERAGE HOURLY EARNINGS AND SUPPLEMENTARY LABOR COST

In the Machine Tool Industry of the United States and Seven Foreign Countries

Country	Date	Industry	Workers Covered	Average Hourly Earnings	Estimated Supplementary Labor Cost	Total Compensation
Sweden	1982	(3)	P.W.	$6.21	$3.84	$10.05
France	1982	(3)	P.W.	4.79	3.64	8.43
Germany (Federal Republic)	1982	(3)	P.W.	6.33	4.61	10.94
Italy	1982	(3)	P.W.	4.03	3.56	7.59
Switzerland	1982	(2)	P.W.	8.05	3.21	11.26
United Kingdom	1982	(3)	P.W.	5.07	1.86	6.93
Japan	1982	(1)	P.W.	5.64	.95(3)	6.59
United States	1982	(1)	P.W.	9.55	3.27	12.82

P.W. - Production Workers.

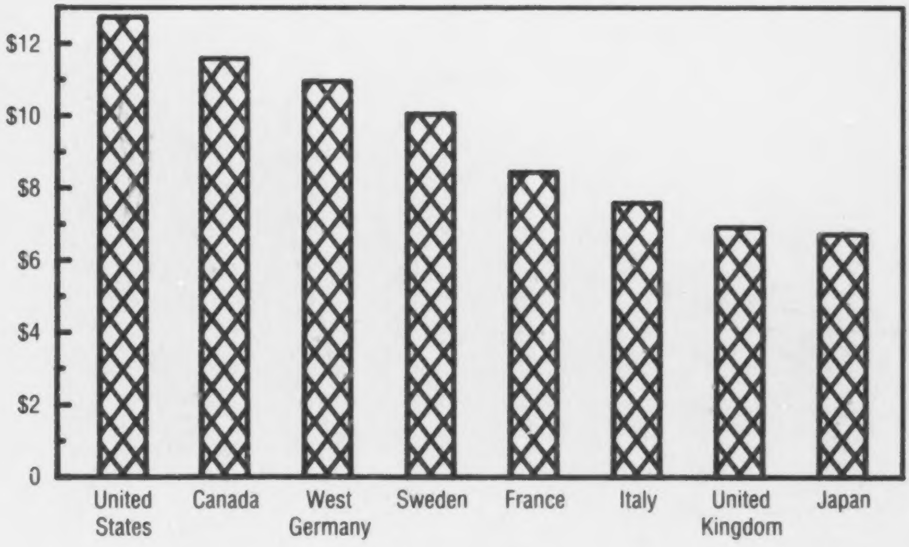
(1) Machine Tools.
(2) Metals and Machines.
(3) Non-Electrical Machinery.

Source: U.S. Bureau of Labor Statistics, Branch of International Comparisons.

This table differs from the one shown in chapter 2 because it focuses directly on the machine tool industry compensation. The other table shows production woker compensation in manufacturing as a whole.

Average Hourly Compensation of Production Workers

Machinery, Except Electrical, 1981



AVERAGE HOURLY EARNINGS IN METAL AND METALWORKING INDUSTRIES
In Selected Countries, for Selected Years

Country	Industry	1975	1979	1980	1981 (r)	1982	Percent Increase 1975-82
Canada	(1)	$5.54	6.84	7.55	8.25	8.75	57.9%
France	(1)	2.97	4.90	5.72	5.15	NA	NA
Italy (r)	(1)	3.22	4.68	5.51	5.13	NA	NA
Japan	(1)	3.90	6.99	7.25	7.94	7.41	90.0
Switzerland	(2)	4.88	8.46	8.89	8.11	8.38	71.7
United Kingdom (a)	(1)	3.07	4.81	6.13	5.84	5.50	79.2
United States	(1)	5.37	7.32	8.00	8.81	9.29	73.0
West Germany	(1)	4.22	7.13	7.69	6.48	6.32	49.8

r - Revised. NA - Not Available.

(a) Men only.
(1) —Machinery, except electrical.
(2) —Metal products, machinery, etc.

Sources: "ILO 1982 Statistical Yearbook" ("Statistics of average earnings . . . usually cover cash payments received from employers, i.e., renumeration for normal working hours, payments for overtime and time not worked (holidays, vacation, etc.), production bonuses, cost-of-living allowances and special premiums . . .").

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS
In Selected Industry Groups, 1982 (a)

Country	All Manufacturing	Machinery, Except Electrical	Electrical Equipment	Motor Vehicles
United States	$11.68	$12.72	$11.39	$18.66
Canada	10.68	11.60	9.55	13.28
France	7.86	8.43	7.78	9.10
West Germany	10.44	10.94	9.89	13.25
Italy	7.36	7.59	7.26	7.74
Japan	5.70	6.74	5.19	7.18
Sweden	10.07	10.05	9.73	10.36
United Kingdom	6.80	6.93	6.47	7.65

(a) Preliminary estimates.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

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8

FINANCE

Publicly available data on the financial status of the machine tool industry is scarce. A few sources are the annual reports of the publicly owned machine tool companies and of other companies that produce machine tools. Government statistics on the capital expenditures for "structures and additions" and for "machinery and equipment" in the metal cutting and metal forming machine tool industries are an indirect measure of financial health.

Selected financial indicators for a machine tool composite from the "Industry Surveys" of Standard and Poor's Corporation are included in this chapter. The machine tool composite combines data for six relatively large machine tool building companies on the basis of the total market value of equity stock outstanding.

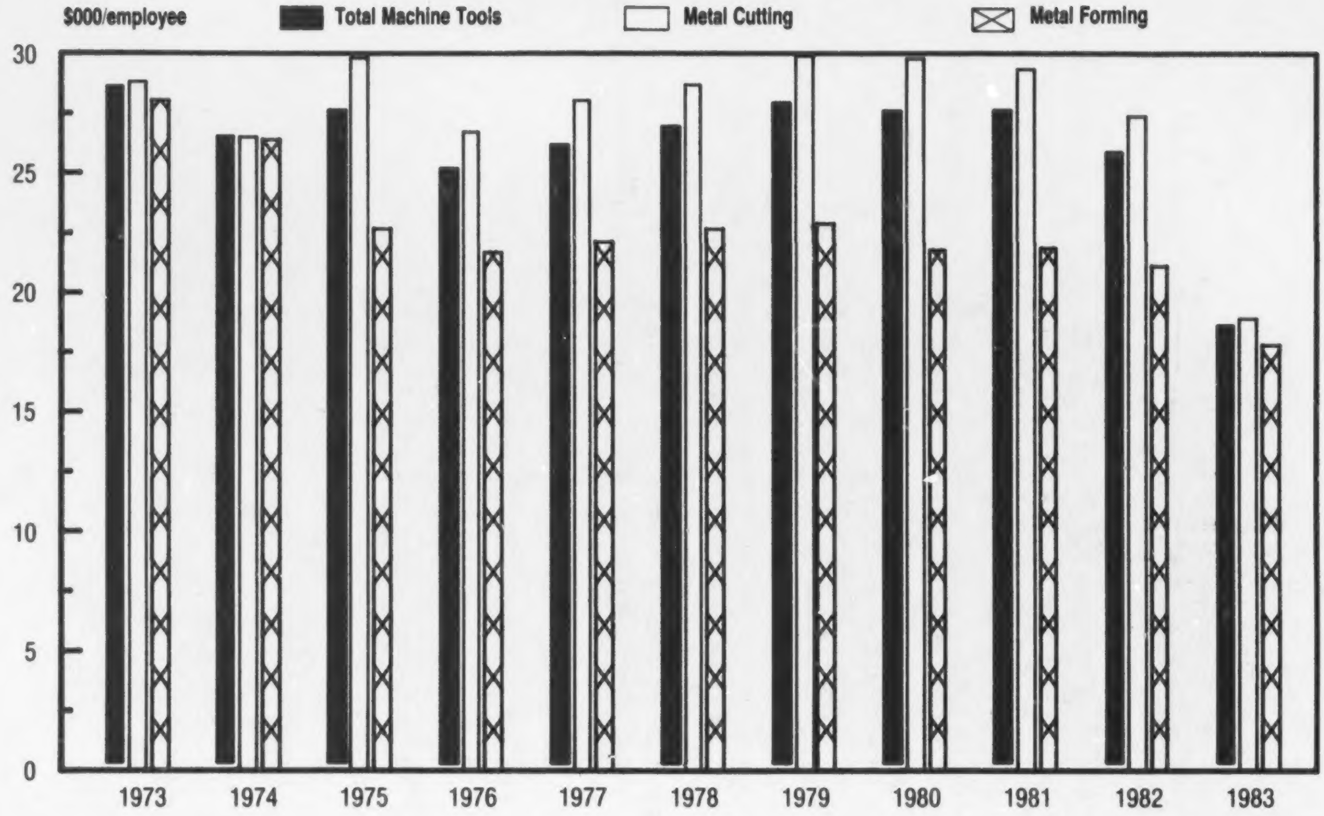
Each indicator from "Industry Surveys" is an index based on average value per share of outstanding stock. We have converted these indicators from the original base of 1941—1943 = 10 to 1967 = 100 to conform with other indexes in this publication. The financial indicators for the composite do not necessarily represent an average for the entire machine tool industry, but given the scarcity of financial information, are a valuable addition to this chapter.

Data collected by an outside research group for the National Machine Tool Builders' Association indicate that the rate of profit of machine tool manufacturers tends to be somewhat higher than that of all manufacturing industries during good times, but drastically worse in less prosperous periods.

It should be emphasized that all the data in this section are in current dollars and that in periods of rapid inflation the true state of earnings and capital accumulation is seriously distorted. In particular, an inflationary environment leads to the overstatement of "inventory profits" and the understatement—relative to replacement costs—of depreciation charges on capital equipment.

Machine Tool Industry Productivity

(Constant Dollar Shipments Per Production Worker)



SELECTED FINANCIAL RATIOS FOR CORPORATIONS IN SELECTED INDUSTRIES, 1983

Industry	% Net Operating Profit on Sales	% Earnings After Taxes on Sales	% Earnings After Taxes On Net Worth	% Depreciation and Amortization on Net Sales	Times Inventory Turnover	Times Current Assets to Current Liabilities
Machine Tools	(7.9)	(6.3)	(8.0)	4.0	2.5	3.1
All Manufacturing Corporations	5.9	4.1	10.7	3.8	6.9	1.6
Durable Manufactures	5.0	3.1	8.3	3.9	5.3	1.7
Electrical Machinery	5.1	3.8	10.2	3.4	5.0	1.6
Machinery, Except Electrical	6.4	4.4	8.2	4.9	4.6	1.9
Motor Vehicles	5.4	4.9	19.2	4.5	11.6	1.3
Chemical and Allied Products	7.3	5.8	12.2	4.3	6.9	1.7

( ) - Negative Number.

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" and NMTBA.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Machine Tool Industry, 1962 to Date

(Millions of Dollars)

Year	Total	Metal Cutting Industry			Metal Forming Industry		
		Total	Structure and Additions	Machinery and Equipment	Total	Structure and Additions	Machinery and Equipment
1962	$ 722	$ 519	NA	NA	$203	NA	NA
1963	743	531	NA	NA	212	NA	NA
1964	800	558	NA	NA	242	NA	NA
1965	NA	NA	NA	NA	NA	NA	NA
1966	NA	NA	NA	NA	NA	NA	NA
1967	1,099	800	$245	$ 555	299	$ 88	$211
1968	1,161	845	253	592	316	94	222
1969	1,224	889	269	620	335	98	237
1970	1,235	884	270	614	351	109	242
1971	1,241	874	272	602	367	114	253
1972	1,228	841	263	578	387	120	267
1973	1,251	851	259	592	400	121	279
1974	1,324	895	260	635	429	131	298
1975	1,356	937	266	671	419	125	294
1976	1,412	1,000	279	721	412	127	285
1977	1,478	1,035	295	740	443	129	314
1978	1,603	1,115	330	785	488	138	350
1979	1,899	1,333	372	961	566	160	406
1980	2,065	1,453	417	1,036	612	168	444
1981	2,263	1,627	463	1,164	636	180	456

NA - Not Available.

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures."

NEW CAPITAL EXPENDITURES IN THE MACHINE TOOL INDUSTRY

1954 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structure and Additions	Machinery and Equipment	Total	Structure and Additions	Machinery and Equipment
1954	NA	$ 37.7	$ 11.2	$ 26.5	NA	NA	NA
1955	NA	44.0	NA	NA	NA	NA	NA
1956	NA	49.2	NA	NA	NA	NA	NA
1957	NA	39.7	NA	NA	NA	NA	NA
1958	$ 30.5	18.8	1.9	16.9	$11.7	$ 3.8	$ 7.9
1959	31.9	22.2	NA	NA	9.7	NA	NA
1960	37.4	24.8	NA	NA	12.6	NA	NA
1961	26.4	18.7	NA	NA	7.7	NA	NA
1962	39.3	26.6	NA	NA	12.7(a)	NA	NA
1963	39.6	28.8	5.4	23.4	10.8	2.1	8.7
1964	71.7	41.7	11.0	30.7	30.0(a)	7.5(a)	22.5(a)
1965	74.2	53.7	10.2	43.5	20.5	4.4(a)	16.1
1966	102.5	74.9	17.1	57.8	27.6	6.2(a)	21.4(a)
1967	104.9	78.7	19.3	59.3	26.2	5.7	20.5
1968	90.9	62.3	9.1	53.2	28.6	7.7	20.9
1969	105.0	75.5	21.8	53.7	29.5	7.7	21.8
1970	72.7	49.3	11.7	37.6	23.4	7.8	15.6
1971	39.1	28.7	4.6	24.1	10.4	1.6	8.9
1972	52.7	35.2	7.2	28.0	17.5	4.7	12.8
1973	65.9	38.4	7.3	31.1	27.5	4.0	23.4
1974	93.3	58.9	10.6	48.3	34.4	8.6	25.9
1975	76.1	52.2	7.9	44.2	23.9	4.0	19.9
1976	93.5	65.2	11.2	54.0	28.3	10.8	17.5
1977	132.4	107.9	19.1	88.8	24.5	2.6	21.9
1978	142.4	102.0	22.4	79.6	40.4	5.8	34.6
1979	199.4	147.6	31.8	115.3	51.8	9.7	42.1
1980	241.0	171.6	39.8	131.8	69.4	14.5	54.9
1981	296.2	233.2	52.3	180.9	63.0	12.8	50.2
1982	194.5	151.3	NA	NA	43.2	NA	NA

NA - Not Available.

(a) Standard errors exceeding 15%, not consistent with other Census data in metal forming.

Note: Change of definition of machine tool industry makes comparisons before 1957 difficult.

Source: U.S. Bureau of the Census, "Census of Manufactures", 1963, 1967, 1972, 1977, 1982; U.S. Bureau of the Census, "Annual Survey of Manufactures."

MACHINE TOOL FINANCIAL INDICATORS (a)
Per Share Data
(1967 = 100)

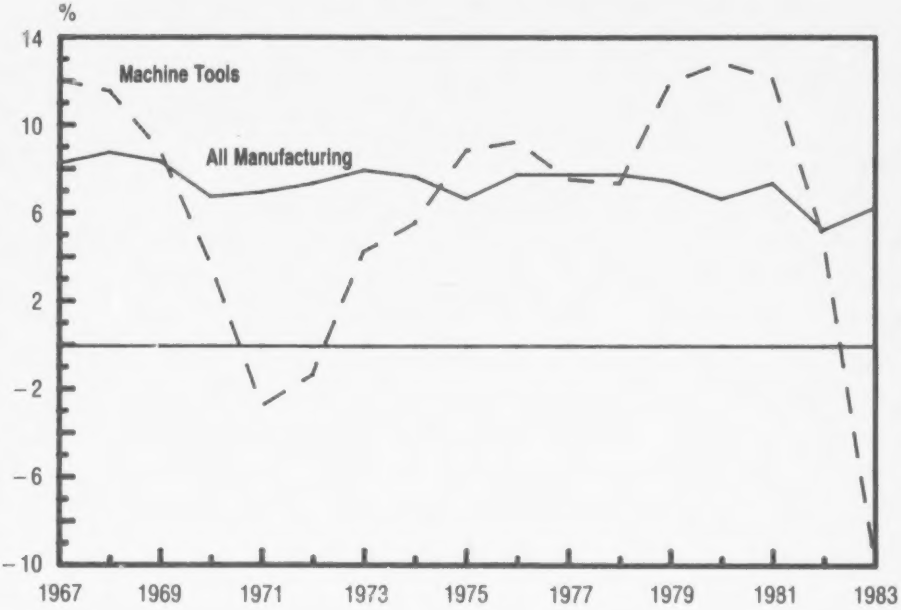
Year	Sales	Operating Profit	Depreciation	Book Value	Working Capital	Capital Expenditures
1956	73.4	66.0	45.8	75.3	67.1	90.7
1957	67.9	53.3	50.9	78.8	71.0	67.2
1958	42.6	14.9	52.4	77.4	70.3	51.4
1959	46.3	15.7	53.8	75.5	68.0	42.5
1960	54.8	26.5	56.6	75.6	65.8	61.1
1961	54.1	29.3	56.1	76.4	67.6	45.3
1962	59.6	28.4	50.9	77.8	70.1	44.9
1963	61.7	37.2	58.0	80.0	72.2	61.9
1964	64.9	57.1	66.0	74.5	66.1	95.1
1965	77.2	70.1	73.6	81.6	82.2	103.2
1966	92.9	88.7	84.4	90.2	92.1	142.5
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	99.0	100.3	117.5	106.9	101.7	167.6
1969	100.7	87.6	118.9	110.2	103.6	156.7
1970	89.7	42.4	120.8	110.1	107.7	122.3
1971	73.4	16.2	112.7	108.0	101.9	93.9
1972	88.4	32.2	111.8	106.2	104.7	150.6
1973	119.4	73.1	116.0	111.8	107.4	217.8
1974	145.0	81.4	124.5	116.5	153.2	247.8
1975	156.6	82.7	136.8	120.5	159.6	176.5
1976	146.9	79.0	142.5	124.8	154.1	156.3
1977	167.2	114.5	151.9	132.5	158.1	208.9
1978	197.7	165.5	157.1	149.2	169.9	248.2
1979	237.5	234.4	177.8	177.8	190.0	371.7
1980	309.2	277.9	218.4	226.8	263.4	542.6
1981	331.1	284.3	259.0	254.7	272.0	489.4
1982	320.3	207.3	334.4	NA	287.4	541.0

(a) Data in this table represent a composite of financial information for six publicly held machine tool companies. Companies included in the group have changed through time, but not since April 1968.

Source: Standard & Poor's Corporation, Data in original form, 1941-43 equals 10, taken from "Industry Surveys", a copyright of Standard & Poor's Corporation. "Industry Surveys" has a wide variety of additional information for the machine tool composite and individual companies.

Net Income Before Taxes As a Percent of Sales

All Manufacturing and Machine Tools, 1967 to Date



AVERAGE NET INCOME OF ALL MANUFACTURING CORPORATIONS AND MACHINE TOOL COMPANIES SURVEYED

1967 to Date

	NET INCOME BEFORE TAXES			
	As Percent of Sales		As Percent of Assets	
Year	All Manufacturers	Machine Tool Manufacturers (a)	All Manufacturers	Machine Tool Manufacturers (a)
1967	8.3%	12.1%	10.9%	16.6%
1968	8.8	11.6	11.7	15.1
1969	8.4	8.9	10.7	10.6
1970	6.8	3.8	8.3	4.8
1971	7.0	(2.7)	8.7	(2.7)
1972	7.4	(1.3)	9.5	(1.4)
1973	8.0	4.3	11.0	4.8
1974	7.7	5.6	10.7	7.2
1975	6.7	8.9	8.8	12.7
1976	7.8	9.3	10.6	12.3
1977	7.8	7.6	13.5	12.8
1978	7.8	7.4	10.7	11.8
1979	7.5	12.0	11.1	16.9
1980	6.7	12.9	9.5	19.4
1981	7.4	12.2	10.5	18.0
1982	5.3	5.0	6.7	6.1
1983	6.3	(9.6)	7.9	(8.7)

(a) Data based on the machine tool activities of about 100 companies.

Note: Figures in parentheses represent negative figures.

Sources: National Machine Tool Builders' Association, Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

MACHINE TOOLS:
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MACHINE TOOLS IN USE

American Machinist magazine has been conducting surveys of metalworking equipment in use by American industry for over 50 years - a total of 13 complete Inventories. Through the years the impact of advancing technology, shifting industrial classifications and improved statistical techniques have brought about changes in procedures for compilation and publication of inventory data.

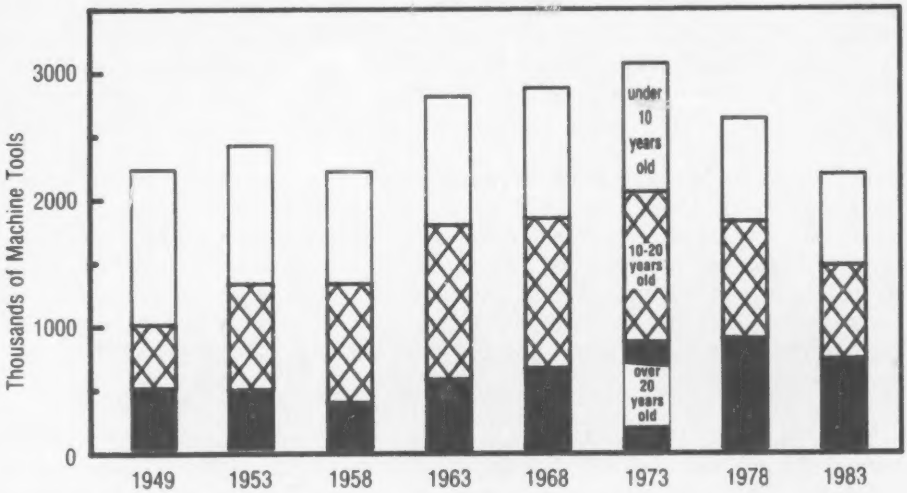
Through 1973, the Inventory was conducted every five years covering all the metalworking industries. The 12th Inventory was conducted over a period of three years with approximately one-third of metalworking surveyed each year from 1976 to 1978. The latest Inventory, the 13th of the series, returned to the format employed in the first eleven, i.e. surveying all metalworking industries in one year. The 13th Inventory was conducted in 1983 and its results were published late in the year. All of the tables and charts in this chapter have been updated to reflect this latest compilation.

The American Machinist Inventory is based on a sample survey and it is the nature of such surveys that the reliability of the data is greatest in the broader categories. The survey's reliability necessarily decreases as results are broken down into smaller and smaller cells. A broad breakdown, such as "grinding machine tools in the North Central States," will therefore tend to be more reliable than a very detailed breakdown such as "circular saws, over 20 years old, in New Mexico and Texas." Another limitation is the coverage of the survey. While the data compiled are believed to accurately reflect the number and types of machine tools in use in U.S. metalworking industries, the user should be aware of the sample's limitations. For all but the 12th Inventory, all of metalworking manufacturing was surveyed to arrive at tabulated results. In the 12th Inventory, estimates were made for metalworking plants with fewer than twenty employees as these establishments were not surveyed. Tables containing these estimates are so noted. Secondly, the coverage of the survey is based on employment totals, not the number of plants. For example, in the 1983 Inventory, the number of plants responding to the survey comprised only 7% of the total number of establishments with more than twenty employees recognized by the U.S. Bureau of Census. However, this 7% represented an employee base of approximately 25% of metalworking employment. This level of representation bolsters the survey's reliability.

Also included in this chapter is a chart of Inventory data showing the number of machine tools in use in seven industrial nations and their average age distribution. This chart brings to light the fact that while the U.S. has a very large stock of machine tools it is also a relatively old, somewhat obsolescent stock.

Additional information concerning the American Machinist Inventory may be obtained from Manufacturing Research Institute of American Machinist, 1221 Avenue of the Americas, New York, New York 10020.

Machine Tools in Use in Metalworking Industries



Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

TOTAL MACHINE TOOLS IN THE UNITED STATES
Estimated Number, 1983

Use or Location	Total	Metal Cutting	Metal Forming
TOTAL	2,896,754	2,247,833	648,921
Metalworking Industries (a)	2,192,754	1,702,833	489,921
Other Industries	380,000	275,000	105,000
Training	74,000	70,000	4,000
In Storage and Surplus	250,000	200,000	50,000

(a) As used here, metalworking industries are: furniture industry (SIC 25), primary metals industry (SIC 33), fabricated metal products industry (SIC 34), non-electrical machinery industry (SIC 35), electrical machinery industry (SIC 36), transportation equipment industry (SIC 37), precision instruments industry (SIC 38), and miscellaneous manufacturing industry (SIC 39).

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE
Metalworking Industries, 1963 to 1983
(Number in Thousands and Percent of Total)

Year-Industry	Total	By Age						With Numerical Control	
		Under 10 Years		10-19 Years		Over 20 Years			
		Number	%	Number	%	Number	%	Number	%
1963									
All Metalworking	2,808.5	1,011.1	36.0	1,215.6	43.3	581.8	20.7	NA	NA
Non-Electrical Machy.	951.9	315.0	33.1	424.0	44.5	212.9	22.4	NA	NA
Metalworking Machy.	210.6	77.9	37.0	90.3	42.9	42.4	20.1	NA	NA
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968									
All Metalworking	2,869.8	1,021.4	35.6	1,176.2	41.0	672.2	23.4	14.2	0.5
Non-Electrical Machy.	912.5	325.3	35.6	350.4	38.4	236.9	26.0	6.8	0.7
Metalworking Machy.	248.7	97.1	39.0	93.9	37.8	57.7	23.2	1.8	0.7
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973									
All Metalworking	3,065.5	1,009.8	32.9	1,185.1	38.7	870.6	8.4	28.6	0.9
Non-Electrical Machy.	1,103.6	379.8	34.4	410.9	37.2	312.9	28.4	15.1	1.4
Metalworking Machy.	274.5	105.5	38.4	102.3	37.3	66.6	24.3	3.3	1.2
Machine Tools	57.1	17.2	20.1	20.0	35.0	19.9	34.9	1.5	2.6
1976-1978 (a, b)									
All Metalworking	2,630.7	802.6	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Non-Electrical Machy.	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machy.	242.1	82.1	33.9	87.8	36.3	72.2	29.8	6.9	3.1
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7
1983 (b)									
All Metalworking	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Non-Electrical Machy.	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machy.	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9

NA - Not Available.

(a) Includes estimates of machines in plants with less than 20 employees.
(b) Machines 20 years old are included in the "Over 20 Years" category.
(c) Metal cutting industries only.

Source: McGraw hill, Inc. "American Machinist," Inventories of Metalworking Equipment, 1963-1983.

MACHINE TOOLS IN USE IN SEVEN INDUSTRIAL NATIONS
By Number and Age
(Number in Thousands)

Country	Year	Total	Percent of Total		
			Under 10 Years	10-19 Years	20 Years & Up
United States	1983	2,193	32.7%	34.0%	33.2%
West Germany (a)	1980	1,250	34.0	18.0	48.0
United Kingdom (b)	1982	775	42.3	30.5	27.2
Japan(c)	1981	918	36.4	28.0	35.6
France	1980	761	35.0	33.0	32.0
Italy (d)	1975	541	38.1	33.9	28.0
Canada	1978	211	35.8	30.4	33.8

(a) Machine tool age classifications are as follows: Under 10 Years, 10 to 14 Years, 15 Years & Up.
(b) Machine tool age classifications are as follows: Under 6 Years, 6 to 19 Years, 20 Years and Up.
(c) Machine tool age classifications are as follows: Under 8 Years, 8 to 12 Years, 20 Years and Up.
(d) Machine tool age classifications are as follows: Under 9 Years, 9 to 17 Years, Over 17 Years.

Source: McGraw Hill, Inc. "American Machinist."

MACHINE TOOLS IN USE
Metalworking Industries, 1983
(Number in Thousands and Percent of Total)

Year-Industry	Total	By Age: Under 10 Years Number	%	By Age: 10-19 Years Number	%	By Age: 20 Years and Over Number	%	With Numerical Control Number	%
TOTAL	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Metal Furniture, Fixtures	26.6	6.9	26.0	11.3	42.3	8.4	31.7	0.6	2.3
Primary Metals	117.8	34.4	29.2	39.6	33.6	43.8	37.2	2.7	2.3
Fabricated Metal Products	518.9	149.4	28.8	179.3	34.5	190.3	36.7	14.5	2.8
Fab. Structural Metal Products	120.3	41.7	34.7	42.1	35.0	36.5	30.3	4.3	3.6
Screw Machine Products	85.7	21.6	25.2	31.3	36.5	32.8	38.3	1.4	1.6
Metal Stampings	96.2	23.6	24.6	32.3	33.6	40.3	41.9	1.9	1.9
Other Fab. Metal Products	216.8	62.4	28.8	73.6	33.9	80.8	37.3	6.9	3.2
Non-Electrical Machinery	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machinery	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9
Special Industry Machy.	80.4	24.1	29.9	27.1	33.8	29.2	36.3	4.0	5.0
General Industrial Machy.	110.0	31.9	29.0	39.5	35.9	38.6	35.1	5.8	5.3
Other Non-Elec. Machy.	412.9	155.3	37.6	137.6	33.3	120.0	29.1	30.9	7.5
Electrical Machinery	245.7	85.3	34.7	90.9	37.0	69.4	28.3	10.8	4.4
Elec. Industrial Apparatus	41.4	13.8	33.2	15.0	36.3	12.6	30.5	1.8	4.3
Communications Equipment	36.6	14.0	38.4	13.6	37.1	9.0	24.5	2.6	7.1
Other Elec. Machinery	167.7	57.5	34.3	62.3	37.2	47.8	28.5	6.4	3.8
Transportation Equipment	303.0	89.0	29.4	92.7	30.6	121.2	40.0	15.3	5.0
Motor Vehicles Equip.	153.2	38.9	25.4	46.8	30.5	67.6	44.1	4.1	2.7
Aircraft and Parts	97.7	34.2	35.0	33.3	34.1	30.2	30.9	8.8	9.0
Other Trans. Equip.	52.0	15.9	30.6	12.6	24.2	23.5	45.2	2.4	4.6
Precision Instruments	109.6	41.3	37.7	40.0	36.5	28.3	25.8	4.9	4.4
Misc. Mfg. Industries	65.9	26.2	39.7	20.2	30.7	19.5	29.6	2.1	3.2

Note: Individual items may not add to totals due to rounding.

Source: American Machinist, "The 13th American Machinist Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major User Industry, 1983
(Number in Thousands)

Using Industry	Total Machine Tools Number	%	Metal Cutting Machines Number	% Under 10 Yrs. Old	Metal Forming Machines Number	% Under 10 Yrs. Old
TOTAL	2,192.8	100.0%	1,702.8	34%	489.9	27%
Furniture & Fixtures	26.6	1.2%	10.8	34%	15.9	21%
Primary Metals Industries	117.8	5.4	88.5	30	29.3	29
Fabricated Metal Products	518.9	23.7	326.0	32	192.9	25
Ordnance & Accessories	24.3	1.1	20.7	20	3.7	18
Non-Electrical Machinery	805.3	36.7	714.8	36	90.5	30
Electrical Machy. & Equipment	245.7	11.2	177.9	36	67.7	31
Transportation Equipment	303.0	13.8	248.6	30	54.4	27
Precision Instruments	109.6	5.0	91.3	38	18.3	33
Miscellaneous Mfg. Industries	65.9	3.0	45.0	47	20.9	23

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

GEOGRAPHICAL DISTRIBUTION OF MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES, 1983

(By Number and Age Distribution)

	Metal Cutting Machines					Metal Forming Machines					No. Units with NC		% Plants with NC		
Region and Area	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Cutting	Forming	Turning	Mach. ctrs.	Forming
U.S.A.	1,702,833	14%	20%	34%	32%	489,921	9%	18%	36%	37%	94,012	9,296	26%	19%	8%
NORTHEAST															
Boston	101,472	15%	21%	33%	32%	27,531	9%	18%	34%	39%	5,641	504	28%	20%	8%
Bridgeport-Hartford	67,581	14	18	34	34	16,389	9	17	36	39	3,893	197	28	24	3
New York-Newark	120,299	15	22	35	28	38,954	10	18	37	35	6,707	936	18	16	6
Buffalo-Syracuse	49,202	12	18	33	37	11,713	9	17	34	41	2,375	154	31	23	10
Philadelphia-Camden	77,535	14	21	34	32	25,286	9	18	35	37	4,057	490	28	19	8
Pittsburgh-Wheeling	47,239	12	20	33	35	13,634	7	16	33	44	2,390	192	31	23	7
SOUTHEAST															
Baltimore	14,065	13	20	34	34	4,212	8	18	35	39	592	86	23	14	14
Richmond	61,169	14	19	35	32	17,231	9	18	38	35	3,340	352	32	23	11
Atlanta-New Orleans	112,738	15	20	33	32	36,520	10	18	36	35	6,362	866	22	13	8
MIDWEST															
Cleveland	75,272	13	19	34	34	21,717	8	17	35	40	3,827	269	27	18	5
Toledo	21,624	10	17	32	40	6,632	7	15	36	42	841	55	27	18	10
Cincinnati-Louisville	57,956	13	19	34	35	16,496	8	16	37	39	2,868	241	29	22	9
Detroit	106,983	13	18	32	37	27,936	8	16	34	42	5,134	319	24	18	3
Indianapolis	45,936	12	18	34	36	14,234	8	16	34	41	1,920	190	28	13	5
Chicago	218,646	13	20	34	32	68,100	9	18	36	37	12,336	1,333	23	16	9
Milwaukee	60,777	12	19	34	35	15,879	8	18	36	38	3,210	260	26	21	9
Minneapolis-St. Paul	34,421	13	21	35	31	9,613	9	18	37	36	1,703	189	31	21	11
St. Louis	49,624	13	20	35	33	18,373	9	17	37	37	1,979	295	21	14	10
SOUTHWEST															
Kansas City - Tulsa	41,236	16	21	32	31	10,470	10	19	35	36	2,677	220	39	27	10
Dallas-Houston	79,137	18	21	31	30	19,848	12	19	35	34	6,110	473	35	20	7
MOUNTAIN AND PACIFIC															
Denver	32,341	15	22	33	30	8,829	10	19	35	36	1,742	238	23	18	12
Seattle-Portland	27,619	15	22	33	31	6,936	11	19	36	34	1,388	155	20	17	6
San Francisco	44,650	16	21	33	29	11,817	11	19	37	33	2,504	292	18	16	9
Los Angeles	155,311	17	22	34	28	41,571	11	19	37	33	10,416	990	28	21	7

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES

By Major Type and Age, 1983

Type of Machine Tool	Plants With	Total Units	Change Since '78	Percent of Total	0-4 Years	5-9 Years	10-19 Years	20 Years and Over
GRAND TOTAL	—	2,192,754	-8%	100.0%	13%	20%	34%	33%
Non-NC Grinding Machines	75%	383,027	0%	17.5%	14%	22%	34%	31%
Non-NC Turning Machines	77	332,327	-14	15.2	10	16	35	40
Non-NC Drilling Machines	74	281,453	-18	12.8	10	18	36	36
Non-NC Milling Machines	74	218,479	-5	10.0	12	20	36	32
Mechanical Presses	43	198.973	-15	9.1	6	14	36	45
Cutoff & Sawing Machines	86	169,107	5	7.7	17	28	33	22
Non-NC Bending & Forming	41	77,285	2	3.5	11	19	38	32
Non-NC Punching & Shearing	41	66,363	9	3.0	11	20	37	32
Hydraulic Presses	38	53,292	-5	2.4	14	22	34	30
Honing, Lapping, Polishing	33	50,626	NA	2.3	12	23	35	30
Non-NC Boring Machines	28	40,462	-17	1.8	8	11	34	47
Gear-cutting & -finishing	10	34,834	-11	1.6	7	11	32	50
NC Turning Machines	26	33.352	236	1.5	58	28	11	3
Tapping Machines	24	28,139	1	1.3	13	25	36	26
Machining Centers	19	24,003	26	1.1	58	26	15	1
Forging Machines	6	19,613	-4	0.9	6	11	30	54
Pneumatic Presses	8	17,656	NA	0.8	18	30	37	16
Broaching Machines	18	16,505	20	0.8	11	15	29	45
NC Milling Machines	16	15,929	209	0.7	44	27	22	6
Station-Type Machines	5	13.588	-25	0.6	16	20	32	31
Electrical-Machining Units	14	12,434	9	0.6	31	28	35	6
Other Non-NC Metal Cutting	4	12,075	NA	0.6	12	18	37	34
Threading Machines	13	11,703	-5	0.5	8	17	37	38
Other Non-NC Metalforming	3	11,255	-67	0.5	6	18	36	40
Coil-Processing Systems	6	10.852	-78	0.5	13	25	35	27
Thread-Rolling Machines	5	8,604	36	0.4	9	17	31	43
Diecasting Machines	2	8,095	-21	0.4	12	24	44	20
NC Drilling Machines	9	7.993	134	0.4	21	29	43	8
Multiple-Side Forming Mach.	2	7.003	-45	0.3	7	21	35	38
NC Punching & Shearing	8	6,223	277	0.3	37	29	26	8
Non-NC Thermal Cutting	8	5,302	-61	0.2	28	33	26	14
NC Boring Machines	7	5.064	68	0.2	29	22	33	17
Other NC Metalcutting	2	3.121	652	0.1	19	25	13	43
NC Bending & Forming	3	2.585	21	0.1	33	26	27	15
NC Grinding Machines	3	2.276	734	0.1	50	21	22	7
Sheet-, Plate-processing	2	1.634	NA	0.1	15	25	24	37
NC Thermal Cutting	3	1.034	NA	0.1	53	29	8	9
Other NC Metalforming	(a)	488	75	(b)	47	18	22	14

NA - Not Available

(a) Percentage is less than 1%.

(b) Percentage is less than 0.1%.

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

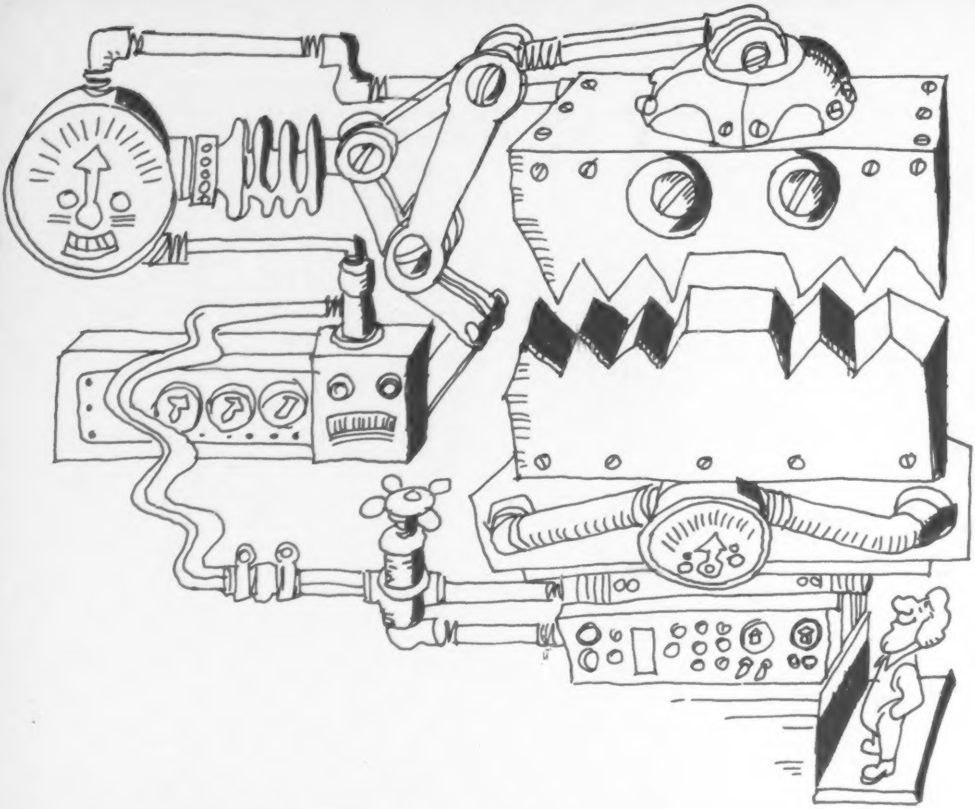
NUMERICALLY CONTROLLED MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES

Number by Type of Machine and User Industry, 1983

	Metal Cutting						Metal Forming
Using Industry	Total	Turn	Bore	Drill	Mill	Machining Centers	Total
TOTAL	94,012	33,352	5,064	7,993	15,929	24,003	9,2[illegible]
Metal Furniture and Fixtures	253	46	19	58	43	23	357
Primary Metals Industries	2,413	842	271	261	433	353	249
Fabricated Metal Products	10,841	4,348	500	1,121	1,676	1,652	3,622
Ordnance and Accessories	797	NA	NA	NA	NA	NA	16
Non-Electrical Machinery	50,698	18,592	2,935	4,205	7,876	13,917	1,843
Metalworking Machinery	11,713	2,716	858	1,136	2,410	3,005	85
Machine Tools	3,373	956	355	400	355	1,103	31
Special Industry Machinery	3,903	1,115	219	559	563	1,3[illegible]	134
Electrical Machinery and Equipment	9,415	2,677	182	1,150	1,983	2,644	1,357
Transportation Equipment	14,397	4,922	907	718	2,145	4,127	887
Aircraft Engines and Parts	8,450	2,790	426	336	1,692	2,810	3[illegible]2
Precision Instruments	4,434	1,538	110	227	1,132	1,240	440
Miscellaneous Manufacturing Industries	1,561	387	140	253	641	47	541

NA - Not Available

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."



U.S. MACHINE TOOL DIRECTORY

Machine tools and related products
built by members of the
National Machine Tool Builders' Association

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7901 Westpark Drive
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Abbreviations

and

Explanation of Terms

ABBREVIATIONS

ADR — The Asset Depreciation Range System
BEA — Bureau of Economic Analysis
BLS — Bureau of Labor Statistics
BTN — Brussels Tariff Nomenclature
CCC — Customs Co-Operation Council
CECIMO — Comité Européen de Coopération des Industries de la Machine Outil
C.I.F. — Cost, Insurance and Freight. Under these terms, the seller quotes a price which includes the cost of the goods, marine insurance and the transportation charges to a specified point of destination.
D — Withheld to avoid disclosing figures for individual companies
E — Estimate
EEC — European Economic Community
F.A.S. — Free Alongside Ship. Prices specified under these export terms provide that the seller delivers the goods to be exported alongside the overseas vessel within reach of its loading equipment.
F.O.B. — Free on Board. Seller is required to place goods aboard the equipment of the transporting carrier without cost to the buyer. The term F.O.B. must be qualified by a name destination.
FTC — Federal Trade Commission
GNP — Gross National Product
ILO — International Labor Organization
ITC — International Trade Commission
NA — Not Available
NC — Numerically Controlled
NEC — Not Elsewhere Classified
NMTBA — National Machine Tool Builders' Association
P — Preliminary
R — Revised
S — Estimate did not meet Publication Standards
SEC — Securities and Exchange Commission
S.I.C. — Standard Industrial Classification
SITC — Standard International Trade Classification of the United Nations
TSUSA — Tariff Schedules of the U.S., Annotated
U.N. — United Nations
VDMA — Verein Deutscher Maschinenbauanstalten
VDW — Fachgemeinschaft Werkzeugmaschinen in VDMA
Z — Figure below the Minimum Unit of Measure Selected

EXPLANATION OF TERMS

ACCESSIONS

........See LABOR TURNOVER

AIRCRAFT, MISSILES AND PARTS

........Industry Group, conforming to the Standard Industrial Classification. Consists of Industry Group, SIC 372, Aircraft and Parts, and SIC 376, Establishments Primarily Engaged in Manufacturing Complete Guided Missiles and Space Vehicles and Parts.

ASSETS, NET

........Total net assets are the sum of all recorded assets after reducing such amount by allowance or reserve for bad debts, depreciation and amortization, but before deducting any liabilities, mortgages or other indebtedness.

AVERAGE HOURLY EARNINGS

........See EARNINGS

AVERAGE STRAIGHT-TIME HOURLY EARNINGS

........See EARNINGS

AVERAGE WEEKLY HOURS

........See HOURS, AVERAGE WEEKLY

AVERAGE WEEKLY EARNINGS

........See EARNINGS

BACKLOG

........See ORDERS, UNFILLED

CANCELLATIONS

........Gross new orders less cancellations equal net new orders in the order data of NMTBA. Cancellation provisions are usually specified in purchase orders.

CAPACITY UTILIZATION

........There are seven different series on capacity utilization. The most widely used are the indexes published by the Federal Reserve Board, the U.S. Department of Commerce's Bureau of Economic Analysis and McGraw-Hill Publications. Though their statistical methodology varies, each of these indexes attempts to present a measure of current physical industrial output levels as they compare to the potential level of output if all available productive facilities were in full use. Some series measure utilization according to absolute output potential while others measure utilization relative to that portion of absolute capacity which management prefers. While these differences lead to divergent index numbers, quite often the relative changes of the different indexes parallel each other.

CAPITAL EXPENDITURES

........See PLANT AND EQUIPMENT

CAPITAL GOOD INDUSTRIES

........This category is defined as the Nonelectrical Machinery industry, exclusive of farm machinery and equipment producers and machinery shops, the Electrical Machinery Industry, exclusive of household appliances and electronic components manufacturers, and the non-defense portion of the following industries: Shipbuilding and Repairing, Railroad Equipment, Communication Equipment, Aircraft and Parts, and Ordnance plus Defense Products.

COMPENSATION

........See EARNINGS; PAYROLL

COMPENSATION, SUPPLEMENTARY

........Supplementary compensation statistics fall into two broad categories and are intended to capture payroll expenditures made by employers which are in addition to the stated hourly wage rate. These categories are:

1. Payments to Workers—which includes payments for paid leave time, premiums for overtime, weekend, holiday, and shift work; non-production bonuses (e.g., Christmas); and terminal payments.
2. Expenditures in Addition to Payroll—which encompass expenditures for which the employer irrevocably makes a payment under the provisions of a legally required insurance program or private welfare plan; e.g., social security, unemployment compensation and other insurance for the benefit of the workers; life, accident, and health insurance; pension and retirement plans; vacation and holiday funds; severance and supplemental unemployment benefit plans; and savings and thrift plans.

For further explanation, see the "BLS Handbook of Methods, U.S. Bureau of Labor Statistics, Bulletin 1910."

CONSTANT DOLLARS

........Constant dollar estimates represent an effort to remove the effects of price changes from statistical series. In general, they are arrived at by dividing current dollar estimates by appropriate price indexes.

Any changes in such a series would reflect only changes in the "real" (physical) volume of output.

........See IMPLICIT PRICE DEFLATOR.

CONSUMER PRICE INDEX

........See PRICE INDEX

CONSUMPTION

........The term consumption, as used in this publication, refers to the domestic production, less exports, plus imports of a particular commodity.

CONTROLS

........See NUMERICAL CONTROLS

CORPORATE CAPITAL CONSUMPTION ALLOWANCES

........Accounting charges which reflect estimates of wear and tear, obsolescence, destruction, and accidental losses of physical capital.

Gross National Product less capital consumption allowances is referred to as Net National Product.

COST OF MATERIALS

........See MATERIALS, COST OF

DEFENSE PRODUCTS

........The "defense products" category for manufacturers' shipments, orders, and inventories consists of communication equipment, complete aircraft and parts, shipbuilding and military tank vehicles and ordnance. See Census Bureau, Current Industrial Report, Series: M3-1 and MA-175 Shipments of Defense-oriented Industries.

DEPRECIATION

........Depreciation is the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are numerous depreciation methods, all based on a periodic charge to an expense account and a corresponding credit to a depreciation reserve.

Plant (Structure and Additions) depreciation and amortization are usually reported separately from machinery and equipment depreciation.

DIFFERENTIAL (SHIFT)

........Shift differentials represent premium payments for work on late or night shifts. They are part of Supplementary Compensation (See COMPENSATION, SUPPLEMENTARY) paid to workers.

DOMESTIC (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........Totals are the sum of "domestic" and "foreign." "Domestic" represents business activity originating within or destined for the United States, its territories and possessions.

DURABLE GOODS

........An item, destined for either producers or consumers, that in normal use is likely to last longer than three years. Consumer durable goods include automobiles, appliances, jewelry and books. Producer durable goods include a wide range of machinery and equipment.

DURABLE GOODS INDUSTRIES

........Comprise manufacturing major industry groups with SIC Codes 19, 24, 25, and 32 through 39. All other manufacturing major industry groups in SIC Codes 20 through 39 are considered as nondurable goods manufacturing industry groups.

EARNINGS

........Earnings are the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, payroll taxes paid by employers are excluded.

........AVERAGE HOURLY EARNINGS

........are on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late shift work, and changes in output of workers paid on an incentive plan.

........AVERAGE STRAIGHT-TIME HOURLY EARNINGS

........exclude premium payments for overtime and for work on weekends, holidays, and late shifts. Regular day-shift wages or salaries paid per hour worked during a standard workweek are included; incentive pay, production bonuses, and cost of living payments are included in these statistics. Non-production bonuses are excluded.

........AVERAGE WEEKLY EARNINGS

........are derived by multiplying average weekly hours by hourly earnings.

ELECTRICAL MACHINERY INDUSTRY

........Major Group 36, Electrical Machinery, Equipment and Supplies according to the Standard Industrial Classification, comprises SIC Industry Groups:

........361. Electrical Transmission and Distribution Equipment
362. Electrical Industrial Apparatus
363. Household Appliances
364. Electrical Lighting and Wiring Equipment
365. Radio and Television Receiving Sets
366. Communication Equipment
367. Electronic Components and Accessories
369. Miscellaneous Electrical Machinery, Equipment and Supplies

EQUITY

........See STOCKHOLDER'S EQUITY

ESTABLISHMENT

........The "establishment" is the basis for reporting to the Census of Manufactures. It is an operating facility in a single location. Where one facility engages in different lines of activity, it is required to submit separate reports, provided that plant records permit such a separation and the activities are substantial in size.

EXCHANGE RATES

........An exchange rate is nothing more than the purchase price of a unit of one nation's currency expressed in terms of another nation's currency. The exchange rates cited in this text are the market rates published by the International Monetary Fund.

EXPENDITURES ON NEW PLANT AND EQUIPMENT

........See PLANT AND EQUIPMENT

EXPORTS

........EXPORTS OF DOMESTIC MERCHANDISE—TOTAL

........Data are compiled from copies of Shippers' Export Declarations filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Values of containers and coverings are included. Freight, insurance and other charges to the point of export are included, but freight and other charges from the place of departure in the United States to the destination in the foreign country are not.

A description of the procedures used for compiling these statistics appears in Report FT 410, United States Exports, Commodity by Country, published by the U.S. Bureau of the Census.

MANUFACTURERS' EXPORT SHIPMENTS

........These data are based on manufacturers' factory shipments for exports. For machine tools the value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines. Rebuilt machinery, machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking are excluded.

FROM FOREIGN COUNTRIES

........Export statistics supplied by the United Nations and foreign countries are defined by the originating agency and may not be comparable to U.S. definitions.

........The International Trade Statistics Center, Statistical Office of the United Nations prepares some special data on the U.S. share of exports from fourteen supplier countries to the world and to 90 countries of destination. The definition of machine tools for this series is the Standard International Trade Classification, Revised (SITC) of the United Nations, SITC NO. 715.1, Machine Tools for Working Metals. (See MARKET SHARE).

Exports are value F.O.B. port of shipment by all reporting countries, except Canada which values exports F.O.B. inland point of shipment and the United States which values exports F.A.S.

U.S. and U.K. data refer to exports of domestic merchandise; data for Denmark, Japan, Norway and Sweden are for exports including re-exports; Canadian data are for general exports.

The table on "Machine Tool Exports from 14 Supplier Countries to the U.S." appearing in this text is based on the U.N. figures.

The special tables on German, British, Italian and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

The definition of "Exports of Domestic Merchandise—Total" is broader than the definition of "Manufacturers' Export Shipments." Exports in the first category should, therefore, be larger than those in the second category. While this generally is the case, it is not always the case. In certain classifications, manufacturers' export shipments in some years exceed total exports of domestic merchandise. The reasons for this may lie in differences in the time of reporting, difference in classifying certain machine tools, and, possibly, in errors of classification on Shippers Export Declarations.

Differences will also be noted between U.S. exports to a foreign country and the imports from the U.S. reported by that country for the same year. The reverse also occurs—U.S. imports from a given country may differ from the exports to the U.S. reported for the same year by that country.

This may be due to differences in the time the exports and imports were reported, differences in determining values, differences in the classification of commodities, differences in conversion of currencies, and errors in classification or computation.

FABRICATED METAL PRODUCTS INDUSTRY

........The Production Indexes published in this book appear as compiled by the Board of Governors of the Federal Reserve System.

........See INDUSTRIAL PRODUCTION

........in all other tables consists of SIC Major Group 34, Fabricated Metal Products except Machinery and Transportation Equipment. The SIC Industry Groups included are:

........341. Metal Cans
342. Cutlery, Hand Tools, and General Hardware
343. Heating Equipment (except electrical) and Plumbing Fixtures
344. Fabricated Structural Metal Products
345. Screw Machine Products, and Bolts, Nuts, Screws, Rivets and Washers
346. Metal Stampings
347. Coating, Engraving and Allied Services
348. Ordnance and Accessories
349. Miscellaneous Fabricated Metal Products

FOREIGN (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........"Totals" are the sum of "domestic" and "foreign." "Foreign" represents all business activity destined for other than the United States, its territories or possessions.

FOREIGN INVESTMENT, DIRECT U.S.

........Direct U.S. foreign investment consists of net capital outflows from the U.S. into businesses in which U.S. residents have significant control. Reinvested returns of the foreign investment are included in these data but portfolio holdings of foreign securities are excluded.

FOREIGN TRADE

........See EXPORTS; IMPORTS

FRINGE BENEFITS

........See COMPENSATION, SUPPLEMENTARY

FURNITURE AND FIXTURE INDUSTRY

........Major Group 25, Furniture and Fixtures, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........251. Household Furniture
252. Office Furniture
253. Public Buildings and Related Furniture
254. Partitions, Shelving, Lockers, and Office and Store Fixtures
259. Miscellaneous Furniture and Fixtures.

GNP—GROSS NATIONAL PRODUCT

........Gross National Product or expenditure is the market value of the output of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods.

Gross national product comprises the purchase of goods and services by consumers and government, gross private domestic investment, and net exports. Beginning with 1960, the estimates include data for Alaska and Hawaii.

GROSS NEW ORDERS

........SEE ORDERS

GROSS PRIVATE DOMESTIC INVESTMENT

........Consists of fixed investment and change in business inventories. Fixed investment measures additions to, and replacements of, private capital brought about through net acquisitions by businesses and non-profit institutions of durable equipment and structures for business and residential purposes.

HEALTH, INSURANCE AND RETIREMENT PLANS

........See COMPENSATION, SUPPLEMENTARY

HOLIDAYS, PAID

........See COMPENSATION, SUPPLEMENTARY

HOURS, AVERAGE WEEKLY

........These statistics are derived by dividing the total of all hours worked in a reporting establishment or industry, including overtime, by the number of employees who received remuneration for their work. Such data differs from standard or scheduled hours.

HOURS, OVERTIME

........Overtime hours represent that portion of the gross average weekly hours which were in excess of regular hours and for which premium payments were made.

Overtime hours are premium hours by definition.

HOURS, SCHEDULED, WEEKLY

........Refers to the predominant work schedule for full-time production workers employed on the day shift.

IMPLICIT PRICE DEFLATOR

........The implicit price deflator is the price index for gross national product. It is a weighted average of the price indexes used to deflate the components of GNP. The implicit weights used are expenditures in the current period. The implicit price index is generally regarded as the best single measure of broad price movement in the economy as a whole.

IMPORTS

........Imports are classified as "general imports" or "imports for consumption." In this volume, we generally speak of "imports for consumption." These are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption.

IMPORTS INTO THE UNITED STATES

........Data are compiled from Import Entries filed with U.S. Customs officials. Import values are in general based on the market value or price in the foreign country at the time of exportation of such merchandise. These values include the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed ready for shipment to the United States, but exclude import duties, insurance, ocean freight and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of exchange prevailing on the day the merchandise is shipped to the United States (but the same rate of exchange may be used for each currency for a 3-month period so long as the rate on any particular day did not vary from it by 5 percent or more).

........Machine tool import data includes used and rebuilt machine tools, replacement parts and home workshop tools. Also included may be some metalworking machinery other than machine tools.

Because the SIC and the statistical export and import classifications were developed independently, there are considerable difficulties in meshing the three systems. Many adjustments are required for comparability. The Census Bureau has published several imports in which comparability is attempted. Among these are annual volumes on U.S. Commodity Exports as Related to Output, U.S. Imports for Consumption and General Imports, SIC-Based Product Classification, by Area, FT 210, and U.S. Exports of Domestic Merchandise, SIC-Based Products and Area, FT 610.

A description of the procedures for compiling import statistics appears in Report FT 135, U. S. Imports, General and Consumption, Schedule A, Commodity and Country, published by the U.S. Bureau of the Census.

IMPORTS INTO FOREIGN COUNTRIES

........The separate tables on German, British, Italian, and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

Differences will be noted between U.S. imports from a foreign country and the exports to the U.S. from that country for the same year. The reverse also occurs—U.S. exports to a given country may differ from the imports from the U.S. reported by that country for the same year. These differences may be due to differences in the time the imports and exports were reported, differences in determining values, differences in classification of commodities, differences in the conversion of currencies, and errors in classification or computation.

INCOME

........NET OPERATING INCOME.

........is total net sales less total operating costs.

NET INCOME (Before Income Taxes).

........is Net Operating Income plus or minus "Other Income and Expense."

OTHER INCOME AND EXPENSE.

........includes interest, income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

NET INCOME (After Income Taxes).

........equals Net Income (Before Income Taxes) less all income taxes.

INDUSTRIAL PRODUCTION, TOTAL

........A measure of the physical output of U.S. manufacturing, mining, and utility industries compiled monthly by the Board of Governors of the Federal Reserve System. Covering about 35% of the total U.S. output of goods and services, the index includes a representative group of products, ranging from pig iron and cotton yarn to machine tools and electricity. It excludes agriculture, construction, and service industries. The relative importance assigned to individual products is based on quantity and value data determined from recent government censuses. Manufacturing accounts for 88.55% of the index, mineral production for 6.37%, and utilities for 5.08%. Current output is expressed as a percentage of annual production levels during 1967.

INSTRUMENTS AND RELATED PRODUCTS

........Major Group 38. Measuring, Analyzing and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks, according to the Standard Industrial Classification, comprises SIC Industry Groups.

........381. Engineering, Laboratory, Scientific and Research Instruments and Associated Equipment
382. Measuring and Controlling Instruments
383. Optical Instruments and Lenses
384. Surgical, Medical, and Dental Instruments and Supplies
385. Ophthalmic Goods
386. Photographic Equipment and Supplies
387. Watches, Clocks, Clockwork Operated Devices, and Parts

INVENTORIES

........End of month stocks of manufacturing establishments regardless of stage of fabrication. These inventories are valued at cost in the economic and statistical indicators, but are valued at current prices in the National Income and Product Accounts (which measure change in business inventories).

LABOR TURNOVER

........Labor turnover is the gross movement of wage and salary workers into and out of employed status with respect to individual establishments. This movement, which relates to a calendar month, is divided into two broad types: accessions (new hires and rehires) and separations (terminations of employment initiated by either employer or employee). Data for each type of action is accumulated for a calendar month and expressed as a rate per 100 employees. The data relate to all employees, whether full- or part-time, permanent or temporary, including executive, office, sales, other salaried personnel and production workers.

ACCESSIONS

........are the total number of permanent and temporary additions to the employment roll including both new and rehired employees.

NEW HIRES

........are temporary or permanent additions to the employment roll of persons who have never before been employed in the establishment.

OTHER ACCESSIONS

........which are not published separately but are included in total accessions, are all additions to the employment roll which are not classified as new hires.

SEPARATIONS

........are terminations of employment during the calendar month and are classified according to cause, quits, layoffs, and other separations, as defined below.

........QUITS

....are terminations of employment initiated by employees, failure to report after being hired, and unauthorized absences.

LAYOFFS

....are suspensions without pay lasting or expected to last more than 7 consecutive calendar days, initiated by the employer without prejudice to the worker.

OTHER SEPARATIONS

....are terminations of employment because of discharge, permanent disability, death, retirement, etc.

LAYOFFS

........See LABOR TURNOVER.

LEADING INDICATORS

........A set of economic time series, each of which usually reaches business cycle peaks and troughs ahead of general economic activity. While there are forty distinctly recognized leading indicators, only 12 are included in the widely publicized "Composite Index of Leading Indicators".

MACHINE TOOL INDUSTRY

........The machine tool industry covers establishments primarily engaged in producing metal cutting type machine tools and metal forming type machine tools. The U.S. Bureau of the Census has assigned industry SIC codes 3541 and 3542 to these industries.

An establishment is primarily engaged in the machine tool industry if the value of machine tools produced exceeds in value the production of products of other industries.

Because many establishments classified as being within the machine tool industry produce not only machine tools (their "primary products") but also other products (their "secondary products"), the "machine tool industry" figures do not measure machine tool activities only. In 1972, for instance, only 86 per cent of the value of shipments of the "metal cutting machine tool industry" consisted of metal cutting machine tools. The most important other products shipped were machine tool accessories and measuring devices.

While not all the shipments of the machine tool industry were made up of machine tools, some other industries did produce machine tools as their "secondary products." The 1972 Census of Manufactures showed that 90 per cent of all metal cutting machine tools were produced by the "metal cutting machine tool industry." The remaining 10 per cent were shipped by other industries. The "machine tool industry" statistics are important because they permit a measurement of the economic status of the plants which make machine tools their major business—their location, employment, payroll, etc. They are less reliable if we want to measure total machine tool production and shipments. To get the facts on total machine tool production, we should look at "Shipments"—see separate entry.

MACHINE TOOL PRODUCTS
........See SHIPMENTS

MACHINE TOOL SHIPMENTS
........See SHIPMENTS

MACHINE TOOLS, COMPLETE
........Machine tools (See MACHINE TOOLS, DEFINITION) as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines.

MACHINE TOOLS, DEFINITION
........Machine tools are either metal cutting machines or metal forming machines.

METAL CUTTING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques. Machine tools of the metal cutting type are classified under SIC product codes, the first four digits of which are 3541.

METAL FORMING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator while in use, for pressing, forging, hammering, extruding, shearing, bending or die casting metal into shape. Machine tools of the metal forming type are classified under SIC product codes, the first four digits of which are 3542.

MACHINERY, EXCEPT ELECTRICAL
........See NONELECTRICAL MACHINERY

MACHINERY AND EQUIPMENT INDUSTRIES
........are classified as a supplementary market category for manufacturers' orders, inventories and shipments. The other categories are "consumer durables" and "defense products." (See separate item—DEFENSE.)

........MACHINERY AND EQUIPMENT INDUSTRIES CATEGORY, consists of,
....nonelectrical machinery
....See NONELECTRICAL MACHINERY, but excluding farm machinery and machine shops; electrical machinery
....See ELECTRICAL MACHINERY, but excluding household appliances, communication equipment and electronic components; shipbuilding and repairing; and railroad and streetcar equipment.

MAJOR USERS—MAJOR USER CATEGORIES
........The major users of machine tools are the nonelectrical machinery industry, the fabricated metal products industry, the electrical machinery and equipment industry and other industry groups (see individual industry groups) listed in the inventory section of this volume.

MAN-HOURS
........All plant man-hours of production and related workers. Represents all man-hours worked or paid

for including actual overtime hours. Excludes hours paid for vacation, holidays or sick leave when the employee was not at the plant.

MANUFACTURERS' EXPORT SHIPMENTS
........See EXPORTS

MANUFACTURERS' NEW ORDERS
........See ORDERS

MANUFACTURERS' SHIPMENTS
........See SHIPMENTS

MARKET CATEGORY
........Major User Categories are classified either by Industry Group or by Market Category.
........See MAJOR USERS, DEFENSE, and MACHINERY AND EOUIPMENT INDUSTRIES

MARKET SHARE:
........Market Share defines what portion of a country's total imports of a specific commodity are attributable to a specific country of origin. The table in Chapter 6 of this text details this data for machine tool exports from the major Western industrial nations.

MATERIALS, COST OF
........"Cost" is defined as the direct charges actually paid or payable for items consumed or put into production during one year, after discounts, and including freight charges and other direct charges incurred by the establishment in acquiring the materials.

........Cost of materials includes:
........the total delivered cost of all raw materials, semi-finished goods, parts, components, containers, scrap, and supplies consumed or put into production during the year:
........the amount paid for electric energy purchased;
........the amount paid for all fuels consumed for heat, power, or the generation of electricity;
........the cost of work done by others on materials or parts furnished by manufacturing establishments (contract work);
........the cost of products bought and resold in the same condition.
....cost of materials excludes the cost of services used, such as,
....advertising, insurance, telephone, etc.;
........research development, and consulting services;
........overhead costs, such as depreciation charges, rent, interest, royalties, etc.;
........expense items chargeable to fixed asset accounts.

METAL FORMING
........See MACHINE TOOLS

METAL CUTTING
........See MACHINE TOOLS

METALWORKING INDUSTRY
........Industry Group 354, Metalworking Machinery and Equipment according to the Standard Industrial Classification. This industry group comprises the following industries,
........3541. Machine Tools, Metal Cutting Types
3542. Machine Tools, Metal Forming Types
3544. Special Dies and Tools, Die Sets, Jigs and Fixtures
3545. Machine Tool Accessories and Measuring Devices
3546. Power Driven Hand Tools
3547. Rolling Mill Machinery and Equipment
3549. Metalworking Machinery, N.E.C.

MOTOR VEHICLES AND PARTS INDUSTRY
........Industry Group 371. Motor Vehicles and Motor Vehicle Equipment, according to the Standard Industrial Classification, comprises the following industries.
3711. Motor Vehicles
3712. Passenger Car Bodies
3713. Truck and Bus Bodies
3714. Motor Vehicle Parts and Accessories
3715. Truck Trailers (Full)

NC
........See NUMERICAL CONTROLS

NET ASSETS
........See ASSETS, NET

NET INCOME
........See INCOME

NET NEW ORDERS
........See ORDERS

NET OPERATING PROFIT
........See INCOME

NET PROFIT ON SALES
........See INCOME

NET SALES
........See SALES

NEW HIRES
........See LABOR TURNOVER

NONELECTRICAL MACHINERY INDUSTRY
........Major Group 35, Machinery, except Electrical, according to the Standard Industrial Classification, comprises,

........351. Engines and Turbines
352. Farm Machinery and Equipment
353. Construction, Mining, and Materials Handling Machinery and Equipment
354. Metalworking Machinery and Equipment
355. Special Industry Machinery, Except Metalworking Machinery
356. General Industrial Machinery and Equipment
357. Office, Computing, and Accounting Machines
358. Refrigeration and Service Industry Machinery
359. Miscellaneous Machinery, Except Electrical

NUMERICAL CONTROLS
........Machine tool control systems which operate a machine by means of numerically coded programs inserted or fed into the systems on tape, punched cards, dials, plugs, preset switches or by playback of prerecorded operating programs.

OPERATING PROFIT
........See INCOME, NET OPERATING

ORDERS
........CENSUS SERIES ON SHIPMENTS, INVENTORIES AND ORDERS

........NEW ORDERS, NET,

....represent gross new orders net of cancellations received during the period. The series of new orders is adjusted for the number of trading days and length of calendar month prior to seasonal adjustment.

UNFILLED ORDERS

....at the end of a reporting period are orders that have not passed through the sales account and are equal to unfilled orders at the beginning of the period plus net new orders received during the period less net sales. Estimates for unfilled orders are obtained for each detailed category by multiplying the estimate for the preceding month by the link relatives based on a matched sample of reporting companies. The data for each company are inflated by their sampling weights before being summarized.

........NMTBA SERIES ON NEW ORDERS AND SHIPMENTS

........GROSS NEW ORDERS, minus CANCELLATIONS, equal NET NEW ORDERS

....The data are collected from participating companies and expanded to industry totals. The totals are adjusted periodically to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include only complete new machine tools and the accessories, attachments and tools ordered with them. They include only orders for machines to be built and assembled in the United States.

UNFILLED ORDERS

....Unfilled orders at the end of the reporting month are unfilled orders at the first of the month, plus new orders, less cancellations and less shipments. Any adjustments (due to corrections, price changes, etc.) are made through adjustments in cancellations, shipments or orders.

ORDNANCE AND ACCESSORIES, EXCEPT VEHICLES AND GUIDED MISSILES

........Major Group 348, Ordnance and Accessories, Except Vehicles and Guided Missiles, according to the Standard Industrial Classification, comprises Industry Groups

........3482. Small Arms Ammunition
3483. Ammunition, Except for Small Arms, not Elsewhere Classified
3484. Small Arms
3489. Ordnance and Accessories, Not Elsewhere Classified

OVERTIME

........See HOURS, OVERTIME

PAYROLL

........Includes the gross earnings paid in the calendar year to all employees on the payroll of operating manufacturing establishments.

Includes all forms of compensation directly to workers such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds.

Does not include employers' Social Security contributions or other non-payroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

PLANT AND EQUIPMENT, EXPENDITURES FOR NEW

........New plant and equipment expenditures refer to all costs (both replacement and expansion) chargeable to fixed asset accounts and for which depreciation accounts (see DEPRECIATION) are ordinarily maintained. Included in the totals are expenditures for new construction, machinery, and new equipment (automobiles, trucks, and other transportation equipment, furniture and fixtures, office machinery and all other new equipment). The figures do not include expenditures for land and mineral rights, maintenance and repair, used plant and equipment, and expenditures made in foreign countries.

PRECISION INSTRUMENTS

........This classification, used in the American Machinist 12th Inventory, is not listed in the Standard Industrial Classification. The closest category is SIC Major Group 38.

........See INSTRUMENTS AND RELATED PRODUCTS

PRICE INDEX ....

The CONSUMER PRICE INDEX measures the effect of price change on the living costs of all urban consumers. It is calculated by comparing, from one period to the next, the cost of a "market basket" of goods and services usually purchased by this particular population group. For more detail, see "The Consumer Price Index, A Short Description of the Index as Revised", U.S. Bureau of Labor Statistics.

The PRODUCER PRICE INDEX is designed to show the general rate and direction of the composite of price movements in primary markets. It is designed to measure "real" price changes between two periods of time, i.e. to measure price changes not influenced by changes in quality, quantity, terms of sale, level of distribution, unit prices or source of price. For a more detailed description, see U.S. Bureau of Labor Statistics Bulletin 1910, "BLS Handbook of Methods".

PRIMARY PRODUCTS

........The products of an establishment which exceed in value its production of products of any other single industry.

PRODUCERS' DURABLE EQUIPMENT

........Includes the new and replacement purchase of various types of machinery, automobiles, trucks and other equipment used by the private sector in the production of goods and services.

PRODUCTION WORKERS

........Production and related workers include working foremen and all non-supervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial and watchman services, product development, auxiliary production for plant's own use, and record keeping and services closely associated with the above production operations.

PRODUCTIVITY

........The total output index divided by the labor input index. The labor input index is the index of hours worked by all persons (formerly called man-hours).

PROFITS

........See INCOME

REAL GNP

........U.S. real GNP data are arrived at by dividing components of the seasonally adjusted current-dollars Gross National Product by appropriate price indexes. About 142 product groups are deflated separately each quarter. The quarterly results are adjusted to the annual constant-dollar figures which are prepared in greater detail.

QUITS

........See LABOR TURNOVER

SALES, NET, TOTAL

........Net Sales are the dollar value of machine tool shipments less returns and allowances, including dealers' commissions, if any.

SALES

........are net of returns, allowances, and discounts.

SCHEDULED WEEKLY HOURS

........See HOURS, SCHEDULED, WEEKLY

SECONDARY PRODUCTS

........Products which do not account for the highest proportion of the total shipments of an establishment and are "primary" to another industry.

SEASONALLY ADJUSTED

........Allowances have been made for recurrent seasonal movements. Dividing actual data by seasonal indexes provides seasonally adjusted data.

SEPARATIONS

........See LABOR TURNOVER

SEVERITY OF WORK INJURIES

........See WORK INJURIES

SHIFT DIFFERENTIAL

........Premium paid above straight-time rates for late or night shift.

SHIPMENTS—TOTAL CENSUS

........The U.S. Bureau of the Census publishes data on the value of all machine tool shipments and miscellaneous receipts. This includes the shipments and receipts of the machine tool industry proper (See separate entry—the Machine Tool Industry) as well as the machine tool shipments made by other industries.

Included in these shipments by product class and industry are not only the major classes of products such as boring machines, drilling machines, presses, etc., but also machine tools primarily designed for home workshops, laboratories, etc., parts sold separately, rebuilt machine tools and some tools not specified by kind. Also included are "miscellaneous receipts" of the machine tool industry for such items as contract and commission work, sales of products bought and resold, repair work, etc.

Every five years, the Census of Manufactures collects these data in considerable detail by seven-digit product codes. More than one hundred metal cutting products and about 50 metal forming products are listed, many by quantity and value, in the Census of Manufactures publication on Metalworking Machinery and Equipment for metal cutting and metal forming machine tools (SIC 3541 and 3542).

In years which are not Census years, an Annual Survey of Manufactures is undertaken which permits compilation of product data for five-digit product classes. Data for non-Census years are estimates based upon reports received from a probability sample of all manufacturing establishments.

The Census of Manufactures and Annual Survey data differ from the totals given by the Current Industrial Reports, MQ-35W, and from the NMTBA reports on shipments. The major differences are listed below.

........The Current Industrial Reports, MQ-35W (See separate entry—SHIPMENTS— COMPLETE MACHINE TOOLS—MQ-35W) differ from the Census of Manufactures and Annual Survey primarily because

........1) they do not include machine tools designed primarily for home workshops, garages, etc.,
2) they do not include parts and rebuilt or used machines.

The Current Industrial Reports, MQ-35W differ from NMTBA shipment reports (See separate item—SHIPMENTS—COMPLETE MACHINE TOOLS NMTBA) primarily because NMTBA reports only on shipments of complete machine tools valued at $2,500 or more.

SHIPMENTS—COMPLETE MACHINE TOOL-MQ-35W

........Data on shipments of complete machine tools are collected quarterly by the Bureau of Census jointly with the Business and Defense Services Administration.

The figures are published in the Current Industrial Reports, Series MQ-35W, Metalworking Machinery.

This report differs from the Census products reports in that it excludes

........1) parts and rebuilt or used machine tools;
2) machine tools primarily designed for home workshops, garages, etc.

........Shipments are shown by 5- and 7-digit SIC codes. The classification of products is being developed jointly by government agencies and industry.

The MQ-35W report also includes separate data on numerically controlled machines and on manufacturers' exports.

The value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments and numerical controls that are ordered and shipped with the machines. Rebuilt machines, machine tools designed for use in home workshops, laboratories, garages, service shops, or for model making, imported machines, and power-driven hand tools are excluded.

SHIPMENTS—COMPLETE MACHINE TOOLS—NMTBA

........The National Machine Tool Builders' Association publishes a monthly report on orders and shipments for complete machine tools separated into metal cutting and metal forming and further subdivided into "domestic" and "foreign."

The data are collected from participating companies and expanded to industry totals. The totals are periodically adjusted to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include new machine tools and the accessories, attachments and tools which are ordered and shipped with them. They cover machines built and assembled in the United States.

NMTBA data are published during the month following the report month.

SHIPMENTS—MAJOR USERS AND MAJOR USER CATEGORIES

........The term "shipments" as used in Series M3-1, Manufacturers' Shipments, Inventories, and Orders, U.S. Bureau of the Census, represents manufacturers' receipts, billings, or the value of products shipped, less discounts, returns, and allowances. Shipments for exports as well as those for domestic use are included.

The shipment estimates are adjusted annually to the benchmark levels from the Annual Survey of Manufacturers. (See also MAJOR USERS.)

STOCKHOLDERS' EQUITY

........Assets minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see Federal Trade Commission—Securities and Exchange Commission, Quarterly Financial Report for Manufacturing Corporations.

STRAIGHT-TIME HOURLY EARNINGS

........See EARNINGS

STRUCTURE AND ADDITIONS
........See PLANT AND EQUIPMENT

SUPPLEMENTARY BENEFITS
........See COMPENSATION, SUPPLEMENTARY

TAXES
........See INCOME TAXES

TRANSPORTATION EQUIPMENT
........The Major Group SIC 37, Transportation Equipment, consists of SIC Groups.

........371. Motor Vehicles and Motor Vehicle Equipment
372. Aircraft and Parts
373. Ship and Boat Building and Repairing
374. Railroad Equipment
375. Motorcycles, Bicycles and Parts
376. Guided Missiles and Space Vehicles and Parts
379. Miscellaneous Transportation Equipment

Each major group or industry group consists of the establishments classified according to their major activity.

UNFILLED ORDERS
........See ORDERS, UNFILLED

UNIT LABOR COST
........Unit labor cost is arrived at by dividing compensation per man-hour by output per man-hour.

VACATIONS, PAID
........See COMPENSATION, SUPPLEMENTARY

VALUE ADDED
........Value added by manufacture is derived by subtracting the total cost of materials (including materials, supplies, fuel, electric energy, cost of resales and miscellaneous receipts) from the value of shipments (including resales) and other receipts, and adjusting the resulting amount by the net change in finished products and work-in-process inventories between the beginning and end of the year.

Value added by manufacture avoids the duplication in the value of shipments figure which results from the inclusion of the shipments of establishments producing materials and components along with the shipments of establishments producing finished products.

VALUE, IN FOREIGN COUNTRY
........See IMPORTS INTO THE UNITED STATES

VALUE, AT PORT
........See EXPORTS OF DOMESTIC MERCHANDISE

VALUE OF SHIPMENTS
........See SHIPMENTS

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